McGraw-Hill
Publishing Co., Inc.©
330 West 42nd Street
New York, N. Y. 10036

EDITORIAL INDEX

electronics®

January through December, 1963, Vol. 36

Additional copies available at 25¢ each

A

ACOUSTICS See Audio

AIR NAVIGATION AND TRAFFIC CONTROL
(See also Space Electronics)
Airlines look to computers to end delays ..... p 66 Oct 25
Army seeks gear for air traffic and navigation ... p 10 Nov 22
British develop new VLF navaid ..... p 36 Aug 16
Crosstalk: Europe's zero-zero landings ..... p 3 Aug 23
Easy way to test accelerometers ..... p 82 Jul 19
FAA cutting localizer cost ..... p 10 Sep 27
F-m feedback stabilizes airborne solid-state VHF transponders ..... p 66 Dec 6
For 'copters, microwave ILS? ..... p 40 Oct 4
Fork drives ILS antenna ..... p 24 Aug 2
Ground position system uses magnetic logic ..... p 8 Aug 9
Improved air traffic communication and weather nets planned ..... p 92 Jan 4
Microelectronic Loran-C will fly next year ..... p 22 Jun 28
Multicomputers to rule English sky ..... p 14 Oct 11
New air-traffic system predicts flight paths ..... p 27 Feb 1
New light on air traffic: bright plan display with alphanumerics ..... p 42 Jul 26
New rdf is loopless ..... p 38 Nov 29
USAF to test triple navigator ..... p 45 Sep 13
Why U.S. lags Europe in automatic landing ..... p 21 Aug 23

AIRCRAFT
Army wants surveillance, armament gear for air arm ..... p 10 Nov 29
Automatic system probes B-70 stresses ..... p 44 Jul 5
Electronics for the SST - what's ahead? ..... p 24 Nov 15
F-104G: boon to Europe ..... p 16 Jun 21
Hot mikes will record air crew's conversation ... p 53 Nov 15
Limited-war needs spur VTOL development ..... p 30 Feb 15
Navy readies airborne data system ..... p 43 Sep 20
New approach to weather data: every plane a station ..... p 38 Jul 12
Robot copters join Navy's anti-sub arsenal ..... p 18 Apr 19
Stage is set again for RS-70 debate ..... p 19 Feb 1
Comment ..... p 4 Mar 1
Unique computer system monitors aircraft engines ..... p 38 Jan 11

ALARM SYSTEMS
Consumer electronics Pt III: Appliances and housewares ..... p 46 May 17
Infrared system detects intruders ..... p 26 Aug 16
Sequence pulse generator saves transistors ..... p 44 Aug 2

AMPLIFIERS
(See also D-C Amplifiers; Lasers; Magnetic Amplifiers; Parametric Amplifiers)
C-W amplitrons for space telemetry ..... p 78 Apr 26
Circuit with a twist: the cascade follower ..... p 69 Dec 6
Consumer electronics Pt III: Appliances and housewares ..... p 46 May 17
Comment ..... p 4 Jul 19
Designing input circuits with lowest possible noise ..... p 46 Aug 2
Designing servo amplifiers for high efficiency ... p 62 Feb 8
Comment ..... p 4 Apr 12
Direct coupling shrinks amplifier size and cost ... p 66 Mar 22
Comment ..... p 4 May 10
Dynamic null - new method for measuring equipment performance ..... p 78 Mar 15
Comment ..... p 4 May 3
Fast age amplifier locks monopulse radar on target ..... p 34 Sep 27
Highlights of small-signal circuit design ..... p 46 Dec 6
Inductors no problem: new thin-film amplifier ... p 46 Jun 7
Latest approach to integrated amplifier design ... p 24 May 31
Light isolates amplifier stages ..... p 43 Nov 1
Low-noise preamplifier uses field-effect transistors ..... p 67 Apr 12
Comment ..... p 4 Jun 21
Muscle voltage moves artificial hand ..... p 34 Oct 11
NEREM: Research in New England ..... p 23 Nov 1
Neodymium-glass amplifier for lasers ..... p 42 Dec 13
New millimeter wave device - beam-plasma amplifier ..... p 40 Nov 8
Nomograph speeds amplifier design ..... p 38 Jul 5
Novel field-effect device provides broadband gain ..... p 30 Nov 1
Optical coupling: new approach to micro-circuit interconnections ..... p 23 Nov 22
Selecting tubes for wide bandwidth ..... p 53 Oct 25
Solving the AGC dilemma - servo system uses attenuator ..... p 60 Jul 19
Tv dissolve wiper ..... p 40 Sep 6
Tunnel diodes Pt II: Amplifiers working beyond transitor capabilities ..... p 68 Jun 21
Unity-gain buffer acquires precision by feedback ..... p 36 Dec 20
Versatile servo amplifier for 50, 60 or 400-cycle operation ..... p 44 Jan 18

ANALOG-DIGITAL CONVERTERS
Continuous readout of magnetic cores ..... p 38 Sep 6
Improving a-d converter accuracy ..... p 38 Sep 13
New digital conversion method provides nanosecond resolution ..... p 55 May 3
Tunnel diodes Pt IV: Logic and switching circuits ..... p 26 Jul 5
Using the latest semiconductor circuits in a UHF digital converter ..... p 37 Aug 30

ANALYZERS See Test Equipment

ANTENNAS
Arecibo-opens new era in radio astronomy ..... p 29 Dec 20
The arrowhead: compact new telemetry antenna ..... p 66 Apr 26
Can I-f communications beat nuclear black-out? ..... p 11 Nov 1
Conical scan array uses variable phase shifters .. p 30 Nov 29
Encapsulating precision antennas in plastic ..... p 68 Mar 8
Fast age amplifier locks monopulse radar on target ..... p 34 Sep 27
German satellite station ..... p 74 Dec 6
Glass-fiber array produces many beams ..... p 28 Nov 1
How computers align phased-array radars ..... p 29 Nov 15
How to measure field patterns with photo-sensitive probes ..... p 39 Jan 25
Hula-hoop antennas: a coming trend? ..... p 44 Jan 11
Inflating antennas in outer space ..... p 74 Feb 22
Latest field-mapping improvement - lead-less transceiver probe works underwater ..... p 56 Jul 19
Measuring missile antenna impedance in flight ... p 36 Jul 12
Microwave components ..... p 28 Dec 6
Multicoupler puts five transmitters on one antenna ..... p 35 Dec 13
Near-field plotter: design tool for milli-meter-wave antennas ..... p 29 Dec 27
New antenna idea: scanning without phase shifters ..... p 27 Mar 29
New rdf is loopless ..... p 38 Nov 29
New telemetry antenna adds flexibility ..... p 48 Feb 1
Comment ..... p 4 Feb 15
Recent tests show tropo scatter better than believed ..... p 42 Mar 1
Unique bridge measures antenna operating impedance ..... p 51 Feb 22
Versatile R-F monitor shows power and VSWR ... p 44 Mar 29

ARTIFICIAL INTELLIGENCE
Components that learn and how to use them ..... p 49 Mar 22
IEEE: ultra-intelligent machines by year 2000 .... p 46 Mar 1

ASTRONOMY
Aiming a 3-ton telescope hanging from a balloon ..... p 47 Feb 8
Eclipse to bare ionosphere's secrets ..... p 26 Jul 19
Racing the solar eclipse ..... p 37 Jul 26
USAF to test triple navigator ..... p 45 Sep 13

ATMOSPHERIC STUDIES
Eclipse to bare ionosphere's secrets ..... p 26 Jul 19
Is ionospheric pollution good? or is it bad? ..... p 40 Apr 26
Nuclear blast effects on communications ..... p 74 Feb 8
Racing the solar eclipse ..... p 37 Jul 26
Radiosonde measures after-effects of solar events ..... p 47 Apr 19

ATOMIC CLOCKS
Frequency control lags ssb: Symposium ..... p 16 Jun 7

ATOMIC RESONANCE
Three-dimensional display uses atomic resonance ..... p 52 Jan 11

ATTENUATORS
Logarithmic attenuator spans three decades ..... p 47 Nov 15

AUDIO
Digital correlator detects voice fundamental ..... p 28 Nov 22
Highlights of small-signal circuit design ..... p 46 Dec 6
How hi is fi? ..... p 33 Jun 14
Comment ..... p 4 Aug 2
Novel feedback loop stabilizes audio oscillator ... p 42 Feb 1
Now a talking computer answers inventory inquiries ..... p 30 Aug 16
Pulses promise simpler audio ..... p 16 Aug 16
Sound: a better way to control pests ..... p 24 Jan 11
Speech operates safety switch ..... p 78 Jun 21
Subaudio parametric amplifier for ocean-bottom seismometer ..... p 28 Mar 1
Two-phase oscillator covers 0.1 to 1,000-cps ... p 27 Oct 4
Two-state modulation simplifies audio circuits ... p 36 Aug 23
Vocal analog synthesizes speech ..... p 46 Oct 11

AUTOMOTIVE
Autos boost solid-state devices ..... p 39 Oct 4
Consumer electronics Pt II: Home and auto controls ..... p 52 May 10
Hula-hoop antennas: a coming trend? ..... p 44 Jan 11
Multitone oscillators - new source of simul-taneous frequencies ..... p 86 Jan 4
Reducing winter skids with a transistor warn-ing circuit ..... p 56 Jan 25

AVALANCHE EFFECT
Avalanche transistors test 10-nsec logic ..... p 46 Jul 12
Comment ..... p 4 Aug 30
Avalanching transistor generates microwaves .... p 35 Oct 25
More reliability with controlled avalanche rectifiers ..... p 38 Mar 29

B

BEAM-SWITCHING TUBES
Contest produces novel circuit designs ..... p 96 Mar 15
New antenna idea: scanning without phase shifters ..... p 27 Mar 29

BIONICS
Bionics Symposium: frog's eye goes to Air Force ..... p 18 Mar 8
ESP: is biological radio communication possible? ..... p 14 Mar 29
Comment ..... p 4 May 10
Experimental neuristor gives nerve-like pulse propagation ..... p 25 Mar 1
IEEE: ultra-intelligent machines by year 2000 . p 46 Mar 1

BRIDGE CIRCUITS
High precision d-c level shifter reduces output impedance ..... p 65 May 3
Subaudio parametric amplifier for ocean-bottom seismometer ..... p 28 Mar 1
Unique bridge measures antenna operating impedance ..... p 51 Feb 22
Versatile R-F monitor shows power and VSWR .... p 44 Mar 29

BUSINESS
Army of the air creates new market ..... p 32 Apr 12

Atomic test ban - what does it mean to our industry? ..... p 18 Aug 2
Autos boost solid-state devices ..... p 39 Oct 4
Color Tv mobilizes for '63 ..... p 21 Mar 1
Consumer electronics
Pt I: Entertainment ..... p 49 May 3
Pt II: Home and auto controls ..... p 52 May 10
Pt III: Appliances and housewares ..... p 46 May 17
Crosstalk: Believe it or not ..... p 3 Mar 29
Disarmament - what chance? what impact? ..... p 56 Sep 6
Electronics industry nudges fourth place nationally ..... p 18 Jul 5
Electronics markets 1963 ..... p 43 Jan 4
"Far-out" space contracts ..... p 18 Feb 22

Home appliances: market for solid state ..... p 14 Sep 13
How to succeed in business on someone else's research ..... p 22 Jul 12
The impact of microelectronics ..... p 51 Jun 28
Industrial electronics showing gain in sales ..... p 18 Nov 1
Industrial spy – aristocrat of thieves ..... p 32 Jul 19
Investment abroad rising ..... p 17 Sep 6
Japanese exports keep climbing..... p 45 May 3
Military electronics will level off in fiscal 1964 ..... p 18 Jan 25
Small-screen Tv sales growing ..... p 11 Dec 6
Spacecom: $100-million-a-year market ..... p 22 Apr 19
Stand by for those Navy RDT&E contracts: $ 1 1/2 billion ..... p 10 Sep 13
Trade Expansion Act: help or hazard? ..... p 28 Mar 8
VE now the rule ..... p 46 Sep 13
Western sales show more zing ..... p 24 Aug 9
When will integrated circuits go civilian? Good guess: 1965 ..... p 22 May 10
Will British TWT's make further inroads? ..... p 50 Jul 12

C

CAPACITORS

By-pass capacitor built into Uhf tuner shaft ..... p 88 Dec 6
Capacitor provides outer coupling for modern coaxial-line circuits ..... p 62 Jan 18
Comment ..... p 4 May 31
Capacitors contain no electrolyte ..... p 52 Mar 29
Cordwood package gets new tubular ceramic capacitors ..... p 43 Aug 16
Electronics color codes ..... p 37 Nov 15
Machine coats films automatically ..... p 86 Apr 26
New glass wets tantalum oxide ..... p 76 Feb 22
Parasitics in integrated circuits: more trouble than meets the eye ..... p 32 Jul 5
Pilot plant mass produces thin films ..... p 64 Jun 7

CARRIER SYSTEMS

Simple transistor modulators improve sideband communications ..... p 54 Mar 8
Wideband communications is Army plan ..... p 18 Apr 5

CATHODE-RAY TUBES

CRT recording has wide bandwidth ..... p 60 Nov 15
Data display system works in microseconds ..... p 26 Nov 29
New deflection circuit uses SCR, saves power... p 56 Aug 9
TVIST: new look in photoelectric storage tubes .. p 74 Jun 21

CATHODES

Are hot cathodes on the way out?..... p 39 Jun 7

CAVITY RESONATORS

New technique protects receivers from high power ..... p 32 Mar 1
Resonant-cavity tuning now made easy ..... p 46 Jan 18
Tunnel diodes Pt I: Using them as sinusoidal generators ..... p 36 Jun 14

CERAMICS

Ceramic substrate improves microcircuit reliability..... p 51 Nov 22
High-temperature ceramic transmits light..... p 62 Mar 8
How ceramic benders control light rays ..... p 80 Jul 19
Comment ..... p 6 Sep 20
How good are beryllia ceramics?..... p 75 Oct 18
Materials for space-age electronics ..... p 37 Oct 25
Window materials for high-power microwave tubes..... p 40 May 31

CHARACTER GENERATORS

Data display system works in microseconds ..... p 26 Nov 29

CHARACTER READERS

French find 7 lucky number..... p 28 Aug 2
ZIP goes the mail! ..... p 26 Jul 12

CIRCULATORS

S-band paramp approaches noise-figure minimum ..... p 57 Jun 28
Tunnel diodes Pt II: Amplifiers working beyond transistor capabilities ..... p 68 Jun 21

CLEAN-ROOM TECHNIQUES

Hospital technique used in work station ..... p 94 Jun 21

COAXIAL CABLES

Capacitor provides outer coupling for modern coaxial-line circuits ..... p 62 Jan 18
Comment ..... p 4 May 31
Coaxial filters – a practical design technique ... p 35 Aug 30
Five-layer diode guards cables ..... p 84 Jun 21
Getting subnanosecond precision in coax cable delay measurements ..... p 39 Feb 1

CODES

French find 7 lucky number ..... p 28 Aug 2
New code standard in U. S. – international adoption next? ..... p 22 Jul 26

COILS

Advances in microminiaturization ..... p 45 Feb 15
Inductors no problem: new thin-film amplifier... p 46 Jun 7
Versatile winder reduces costs ..... p 80 Nov 8
Voltage monitor needs only two saturable cores.. p 50 Jun 7
What you must know to use ferrites at low frequencies ..... p 38 Mar 1

COLOR CODES

Electronics color codes ..... p 37 Nov 15

COLOR TELEVISION

Brighter color Tv in offing?..... p116 Jan 4
Color Tv mobilizes for '63..... p 21 Mar 1
Consumer electronics Pt I: Entertainment ..... p 49 May 3
Europe's color-Tv competition ..... p 22 Aug 2
Here's that new color-Tv tube ..... p 26 Jun 28
Presenting radar targets in color ..... p 54 Oct 18
Tv test uses two colors ..... p 42 May 3
Tri-optic system projects color Tv ..... p 42 Oct 4
Two-tube color camera ..... p 28 Jun 7

COMMUNICATION

AFCED: Military communication systems get simpler, smaller, faster ..... p 14 Jun 14
After Echo II: what and why? ..... p 24 Sep 6
Air Force plans net to survive nuclear attack.... p 28 Mar 22
Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12
Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
Can 1-f communications beat nuclear blackout?. p 11 Nov 1
Communicating with future deep-space probes ..... p 28 May 31
Communications range nomograph ..... p 41 Dec 20
ComSat tackles problems – technical and fiscal.. p 18 Aug 9
Crosstalk: Needles no more ..... p 3 Jul 5
Data communications boom gathers steam ..... p 26 May 10
DOD satellite net set for awards ..... p 26 Jun 7
Down Under – suddenly Mecca for radio men ... p 20 Jan 4
ESP: is biological radio communication possible? ..... p 14 Mar 29
Comment ..... p 4 May 10
Fail-safe squelch circuit adapts to changing noise levels..... p 88 Jan 4
Faster digital communications with duobinary techniques ..... p 61 Mar 22
First color facsimile transmitted by satellite..... p 51 May 24
GaAs laser transmits wideband data ..... p 24 Oct 18
German satellite station ..... p 74 Dec 6
Getting the most out of aerospace telemetry..... p 23 Sep 27
Hot line: for cool nuclear decisions ..... p 18 Jun 28
Hula-hoop antennas: a coming trend? ..... p 44 Jan 11
Improved air traffic communication and weather nets planned ..... p 92 Jan 4
Injection laser systems for communications tracking ..... p 35 Dec 13
Is this the ultimate in data coding? ..... p 18 Jun 21
Military radio swinging to ssb ..... p 29 Apr 5
Modulated infrared diode spans 30 miles ..... p 38 Apr 5
NASA studies earth-space-earth laser links .... p 22 May 10
New chore for orbiting dipoles ..... p 14 May 31
New code standard in U. S. – international adoption next? ..... p 22 Jul 26
New look in this year's comsats ..... p 18 Jul 19
New modulation technique simplifies circuits ... p 52 Jan 25
New transducers for communicating by seismic waves ..... p 51 Apr 12
Comment ..... p 4 May 24
Nuclear blast effects on communications ..... p 74 Feb 8
The optical heterodyne – key to advanced space signaling ..... p 29 Jul 12
Orbital-scatter concept proves out ..... p 26 Nov 8
RFI – causes, effects, cures ..... p 37 Jun 21
Comment ..... p 4 Aug 30
Recent tests show tropo scatter better than believed ..... p 42 Mar 1
Simple transistor modulators improve sideband communications ..... p 54 Mar 8
Skip radio replaces Alaskan cable ..... p 30 Jul 26
Spacecom: $100-million-a-year market ..... p 22 Apr 19
Speeding digital data over phone lines ..... p 30 Sep 27
Ssb system goal is 2-year life ..... p 75 Oct 25
Syncom's time delay: no great problem ..... p 11 Nov 8
Telepathy maybe..... p 42 Oct 11
Tunnel diodes Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
Unique synchronizing technique increases digital transmission rates ..... p 75 Mar 15
West Ford dipole belt girdles earth ..... p 12 Jul 5
Wideband communications is Army plan ..... p 18 Apr 5

COMPONENTS

Accurate gyro balancing ..... p 81 Oct 25
Active components: more breakthroughs on the way ..... p 24 May 17
British Show: Microcircuits are busting out in Britain ..... p 60 Jun 7
Components that learn and how to use them .... p 49 Mar 22
Electrochemical Society Symposium: Bright future seen for organics ..... p 51 Oct 11
Electronics market 1963 ..... p 43 Jan 4
Microwave components ..... p 28 Dec 6
Miniature components aimed for mass markets ... p 64 Apr 19
The negative resistance element (NRE): a new circuit component ..... p 21 May 31
Comments p 4 Jul 5, p 4 Jul 12, p 4 Jul 19

COMPUTERS

(See also Digital Techniques; Logic Circuits; Memories)

Analog ratio computer uses Hall multiplier..... p 46 Nov 8
Automatic computer identifies color ..... p 44 Sep 27
Computer analyzes x-rays ..... p 38 Nov 1
The computer: design assistant extraordinary ... p 16 May 17
Computer diagnoses heart disease ..... p 80 Dec 6
Computer runs missile tracker ..... p 12 Jun 14
Computer translates Chinese into English ..... p 56 Jun 7
Computers in the front lines: micromodules make it possible ..... p 77 Jan 4
Contest produces novel circuit designs ..... p 96 Mar 15
Data communications boom gathers steam ..... p 26 May 10
Designing data registers with simple diode circuits ..... p 48 Feb 22
Designing digital equipment with semiconductor networks..... p 35 Jan 18
FJCC: What's new in computer memories ..... p 35 Nov 8
For command & control: paper prototypes next ..... p 28 Jun 28
For life sciences: a do-it-yourself computer ... p 28 Jul 26
How computers align phased-array radars ..... p 29 Nov 15
How to quiz a whole memory at once ..... p 43 Nov 15
ISA: Safer power plants: why not? ..... p 38 May 24
Laser may accelerate computer..... p 39 Oct 4
Mesucora: French control systems sophisticated, as usual ..... p 14 Nov 29
Microcomputer comes off the line ..... p 14 Nov 1
Multicomputers to rule English sky..... p 14 Oct 11
NASA unveils Apollo computer ..... p 17 Sep 27
Navy readies airborne data system..... p 43 Sep 20
New air-traffic system predicts flight paths ..... p 27 Feb 1
Now a talking computer answers inventory inquiries ..... p 30 Aug 16
Optical computers approach reality ..... p 72 May 3
Polaris-proven electronics to guide Apollo..... p 14 Oct 4
600,000 WPM printer races computer ..... p 26 May 24
Solid-State Conference: Computer speeds go higher ..... p 19 Mar 8
Special computer integrates rainfall ..... p 70 May 24
Three new computer systems announced ..... p 10 Dec 13
Unique computer system monitors aircraft engines ..... p 38 Jan 11

CONFERENCES

AES: Foil stabilizes electret mike ..... p 68 Oct 25
AFCED: Military communication systems get simpler, smaller, faster..... p 14 Jun 14
AIP: Nuclear blast effects on communication ... p 74 Feb 8
Aerospace Conference: Air Force outlines latest R & D plans ..... p 16 May 24
Air Traffic Association 8th Annual Meeting: Airlines look to computers to end delays..... p 66 Oct 25
Bionics Symposium: Frog's eye goes to Air Force ..... p 18 Mar 8
Boston Laser Conference: The medical laser: new tool for cancer research..... p 15 Aug 16
Britain Physics Show: Tunable detectors, faster microwave switching..... p 22 Feb 1
British Show: Microcircuits are busting out in Britain..... p 60 Jun 7
ECCANE: Active thin-film device problems fade ..... p 41 Oct 11
Electrochemical Society: Chelate lasers are coming on strong..... p 32 Apr 26
Electrochemical Society Symposium: Bright future seen for organics ..... p 51 Oct 11
Electron Beam Symposium: Microwelding – laser or electron beam? ..... p 23 Jul 5
Electronic Components Conference: Active components: more breakthroughs on the way ..... p 24 May 17
Electronic Packaging Conference: Hot-air machine speeds soldering ..... p 44 May 31
FJCC: What's new in computer memories ..... p 35 Nov 8
IEEE: Conductive memory points to new displays. p 10 Nov 8
IEEE: Device powers go higher ..... p 57 Nov 15
IEEE: Instruments extend operating ranges, are easier to work ..... p 33 Mar 15
IEEE: Microcircuits graduate into hardware products ..... p 38 Mar 15
IEEE: Preview of first convention ..... p 63 Mar 15
IEEE: Space round trips push techniques ..... p 40 Sep 27
IEEE: Ultra-intelligent machines by year 2000... p 46 Mar 1
IEEE Solid State Conference: Look at what optical semiconductors do now ..... p 32 Jun 28
IEEE Solid State Conference: New laser structure drives output past 1 w ..... p 24 Jun 21
INEL: Transistors control trains ..... p 10 Sep 27
INTERMAG: Packing a half-million bits in a cubic inch ..... p 58 Apr 19
IRE: Large displays: military market now, civilian next ..... p 24 Jan 25
IRE Millimeter Conference: Try developing MM components ..... p 24 Jan 18

ISA: Safer power plants: why not? ..... p 38 May 24
ISA: Telemetry on muscle power ..... p 14 Sep 20
The impact of microelectronics ..... p 51 Jun 28
International Symposium on Nuclear Electronics: Nuclear instruments near picosecond working speed ..... p 43 Dec 13
Laser meetings double up ..... p 22 Apr 12
MHD Conference: Plasma accelerator work shows promise ..... p 38 Apr 26
Mesucora: French control systems sophisticated, as usual ..... p 14 Nov 29
Metallurgical Society of AIME: Future keyed to materials properties ..... p 66 Sep 6
NEC: Electronics in the Midwest ..... p 31 Oct 25
NEREM: Research in New England ..... p 23 Nov 1
Quantum Electronics' Symposium: What's new in lasers? ..... p 14 Mar 1
RFI: In microcircuits it's different ..... p 28 Jun 14
Radio Fall Meeting: New tubes and circuits for consumer electronics ..... p 47 Jan 11
Society for Information Display: Air Force display selects data from 1,890 channels ..... p 10 Oct 18
Society of Photographic Instrumentation Engineers symposium: From flash guns to lasers ..... p 16 Aug 16
Solid-State Conference: Computer speeds go higher ..... p 19 Mar 8
Solid-State Conference: Solid progress in solid-state seen at Philadelphia ..... p 12 Mar 1
Symposium: Field modulates laser ..... p 26 Apr 26
Comment ..... p 4 Jun 28
Symposium: Frequency controls lags sib ..... p 16 Jun 7
Symposium: What happens to dielectrics in space? ..... p 68 Jul 19
Third National Conference on Peaceful Uses of Space - R & D goes back to earth ..... p 30 May 17
Vacuum Symposium: Modulated beams build microcircuits ..... p 26 Oct 25
WESCON: High power at millimeters - plasma harmonics the key ..... p 16 Aug 30
WESCON: Invited sessions dig into future techniques ..... p 26 Aug 9
WESCON: Micro-packaging for micro-electronics ..... p 88 Aug 9
WESCON: The technical highlights ..... p 49 Aug 9
WESCON: Watchful eye on company seminars ..... p 29 Aug 9

CONNECTIONS

Ceramic substrate improves microcircuit reliability ..... p 51 Nov 22
Checking connector production ..... p 96 Feb 8
Flip chips easier to connect ..... p 82 Oct 18
Interconnections pose design problems ..... p 54 Feb 1
Laser welds copper leads ..... p 88 Oct 25
Machine simplifies bonding process ..... p 60 Feb 1
New circuit board planned for Apollo accommodates integrated circuit blocks ..... p 84 Jun 21
Preformed circuits reduce joining operations ..... p 45 Aug 23
Programming speeds wire wraps and routing ..... p 62 Sep 13
Serrations solve wire-termination problem ..... p 86 Jan 25
Tool speeds solderless terminations ..... p 68 Aug 2
WESCON: Micro-packaging for micro-electronics ..... p 88 Aug 9
What makes a solder joint good? ..... p 50 Nov 29
Which permanent electrical connection should you use? ..... p 50 Jan 25

CONSTANTS

Designing zero-drift d-c differential amplifiers .. p 66 Nov 8

CONTROL CIRCUITS

Magnetic strip keeps tape running true ..... p 42 Jan 11
Mesucora: French control systems sophisticated, as usual ..... p 14 Nov 29
Speech operates safety switch ..... p 78 Jun 21
Taking human error out of nuclear experiments ..... p 46 Jun 14
Using varactors to extend frequency-control .... p 48 Nov 8

CONVERTERS

(See also Analog-Digital Converters)

Inside the orbiting geophysical observatory ..... p 61 Feb 15
Latest multivibrator improvement - linear voltage-to-frequency converter ..... p 64 Apr 26
Multi-quantum conversion shown ..... p 50 Sep 20
New digital conversion method provides nanosecond resolution ..... p 55 May 3
Tunnel diodes Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
Unijunction transistor simplifies voltage-frequency converter ..... p 56 Oct 25

CORES

(See also Ferrite Devices; Memories)

Continuous readout of magnetic cores ..... p 38 Sep 6
Plated holes simplify memory design ..... p 34 Nov 1
Thick-film memory has high output ..... p 40 Nov 1
Voltage monitor needs only two saturable cores ..... p 50 Jun 7

COUNTERMEASURES

Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
Countermeasures equipment eyes Cuba ..... p 22 Feb 8
Designing radar receivers to overcome jamming .. p 50 May 17
Radio-interference control ..... p 56 Apr 26
Comment ..... p 4 Jan 7
Strike will be "big buy" ..... p 26 Jun 14
Will lasers protect our cities against ICBM's? ... p 20 May 3

COUNTERS

Biquinary indicator uses 7 transistors ..... p 58 Jul 12
Bi-quinary scaling: accuracy and simplicity at 500 Mc ..... p 34 Nov 15
Designing data registers with simple diode circuits ..... p 48 Feb 22
Developing true solid-state static alternators ... p 58 May 24
Getting subnanosecond precision in coax cable delay measurements ..... p 39 Feb 1
How to design arbitrary-length binary counter ... p 34 Dec 27
Novel coincidence technique for transistor decade counter ..... p 71 Feb 15
Radiosonde measures after-effects of solar events ..... p 47 Apr 19
Simple counter tester uses cascaded one-shots ... p 40 Apr 5
Tunnel diodes Pt IV: Logic and switching circuits ..... p 26 Jul 5
Unique synchronizing technique increases digital transmission rates ..... p 75 Mar 15
Using microcircuits in high-resolution range counters ..... p 31 Nov 22
VHF counter measures time intervals precisely ..... p 27 Aug 23
Why a ring counter - why not a binary? ..... p 44 Jan 25

CRYOGENICS

Cryogenics for the electronics engineer ..... p 29 Aug 30
Homogeneous semiconductors - a new generation of devices ..... p 65 Jun 21
Novel test techniques measure Q in cryogenic resonant circuits ..... p 43 Feb 22

CRYSTALS

Crystal-controlled multivibrator has better stability ..... p 60 Apr 12
Comment ..... p 4 May 17
Gatling-gun laser - novel approach to optical radar ..... p 25 Sep 20
Materials for space-age electronics ..... p 37 Oct 25
New 40-mm silicon crystals permit larger-capacity devices ..... p 84 Feb 8
Solid crystal modulates light beams ..... p 58 Dec 20
Thin films: automatic deposition control ..... p 33 Mar 29
Ultrasonics state-of-the-art report ..... p 33 Oct 18
Wires cut crystals accurately ..... p 46 Nov 1

D

DATA PROCESSING

Circuit converts one-trace scopes to raster display ..... p 33 Nov 29
Data communications boom gathers steam ..... p 26 May 10
Faster digital communications with duobinary techniques ..... p 61 Mar 22
Is this the ultimate in data coding? ..... p 18 Jun 21
Navy readies airborne data system ..... p 43 Sep 20

D-C AMPLIFIERS

Designing zero-drift d-c differential amplifiers .. p 66 Nov 8
Developing radiation-proof space equipment .... p 70 Aug 9
Pulse-width modulator offers precision performance ..... p 29 Oct 11

DELAY LINES

Ultrasonics state-of-the-art report ..... p 33 Oct 18

DEMODULATORS

New phase-tracking demodulator will not lock on sidebands ..... p 52 Feb 8

DETECTION

Air Force research aim: detection capabilities ..... p 72 Apr 26
Black box blast detection - hope or hoax? ..... p 26 Jan 4
Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
Consumer electronics Pt II: Home and auto controls ..... p 52 May 10
Infrared mine detector a reality ..... p 54 Aug 2
Infrared system detects intruders ..... p 26 Aug 16
Long-range spectrometer seeks missile defense clues ..... p 16 May 10
Microwave device detects plastic, metal mines .. p 7 Aug 9
Predetection recording: Solution to the telemetry dilemma? ..... p 30 Sep 13
Test-ban monitors set for launch ..... p 57 Oct 18

DIGITAL TECHNIQUES

(See also Pulse Techniques)

Bi-quinary scaling: accuracy and simplicity at 500 Mc ..... p 34 Nov 15
Circuit converts one-trace scopes to raster display ..... p 33 Nov 29
Contest produces novel circuit designs ..... p 96 Mar 15
Delta modulator codes television waveguide link ..... p 50 Aug 2
Digital correlator detects voice fundamental .... p 28 Nov 22
Faster digital communications with duobinary techniques ..... p 61 Mar 22
Inside the orbiting geophysical observatory ..... p 61 Feb 15
Low-cost circuit measures frequency translation . p 51 Nov 8
Microelectronic Laran-C will fly next year ..... p 22 Jun 28
New chore for orbiting dipoles ..... p 14 May 31
New code standard in U. S. - international adoption next? ..... p 22 Jul 26
New digital conversion method provides nanosecond resolution ..... p 55 May 3
New modulation technique simplifies circuits ... p 52 Jan 25
Realistic sonar trainer simulates ship's wakes ..... p 84 Mar 15
Sequence pulse generator saves transistors ..... p 44 Aug 2
Simple counter tester uses cascaded one-shots ... p 40 Apr 5
Simulating tactical radar and sonar ..... p 25 Dec 13
Slow sampling saves time ..... p 40 Nov 29
Speeding digital data over phone lines ..... p 30 Sep 27
Unique synchronizing technique increases digital transmission rates ..... p 75 Mar 15
Using microcircuits in high-resolution range counters ..... p 31 Nov 22
Well mean photoconductors replace relays in low-speed logic? ..... p 46 May 10

DIODES

(See also Tunnel Diodes)

Backward-diode clamp reduces tunnel-diode delays ..... p 56 Feb 8
Basic rules for designing reliability into semiconductor circuits ..... p 62 Apr 12
Built-in diodes protect nickel cadmium cells .... p 50 Dec 13
Designing data registers with simple diode circuits ..... p 48 Feb 22
Diode lamp makes tape readers faster ..... p 44 May 17
Comment ..... p 4 Jul 26
Diode receives optical signals ..... p 17 Sep 13
Diodes tolerate high radiation ..... p 48 Nov 29
Electronics color codes ..... p 37 Nov 15
Epoxy pellets improve diode production ..... p 64 Jul 26
Family tree of semiconductors ..... p 45 Apr 26
Five-layer diode guards cables ..... p 84 Jun 21
High speed integrated circuits with load-compensated diode-transistor logic ..... p 68 Mar 15
Highlights of small-signal circuit design ..... p 46 Dec 6
Hot carrier diodes switch in picoseconds ..... p 53 Jul 19
How diodes keep current to constant value ..... p 74 Jan 25
IEEE Solid State Conference: Look at what optical semiconductors do now ..... p 32 Jun 28
Improving pulse rise time with snap-off diodes ... p 68 Feb 15
Comment ..... p 4 Apr 5
A key to nanosecond switching combining tunnel and charge-storage diodes ..... p 42 Oct 18
Logarithmic attenuator spans three decades ..... p 47 Nov 15
Modulated infrared diode spans 30 miles ..... p 38 Apr 5
More reliability with controlled avalanche rectifiers ..... p 38 Mar 29
New look at negative-resistance devices ..... p 35 Mar 8
Comment ..... p 4 Apr 26
New technique protects receivers from high power ..... p 32 Mar 1
The PIN diode: versatile microwave component ..... p 40 Mar 8
Rapid method measures diode characteristics .... p 50 Jun 14
Solid-state components shrink photoflash control ..... p 70 Apr 12
Three new approaches to pulse modulation ..... p 62 May 3
The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
WESCON: technical highlights ..... p 49 Aug 9

DIP SOLDERING See Soldering; Printed Wiring

DIPOLES

Crosstalk: Needles no more ..... p 3 Jul 5
West Ford dipole belt girdles earth ..... p 12 Jul 5
West Ford dipoles diffusing as planned ..... p 7 Jul 26

DISPLAYS

Air Force display selects data from 1,890 channels ..... p 10 Oct 18
Air-sea-sub display plots naval targets ..... p 20 Jun 7
Biquinary indicator uses 7 transistors ..... p 58 Jul 12
Circuit converts one-trace scopes to raster display ..... p 33 Nov 29
Data display system works in microseconds ..... p 26 Nov 29
Large displays: military market now, civilian next ..... p 24 Jan 25
Latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
New air-traffic system predicts flight paths ..... p 27 Feb 1
New light on air traffic: bright plan display with alphanumerics ..... p 42 Jul 26
Presenting radar targets in color ..... p 54 Oct 18
Subnanosecond radar shows high resolution ..... p 36 May 31

Sweep measurements - making the tough ones easy ... p 52 Apr 19
Three-dimensional display uses atomic resonance ... p 52 Jan 11

DOPPLER EFFECT
Low-noise c-w klystron oscillators meet doppler radar requirements ... p 85 Dec 6
Phase-locked klystrons simulate doppler radar ... p 44 Apr 19

E

EDUCATION
Crosstalk: Continuing education ... p 3 May 17
FCC may move airborne Tv to microwave ... p 20 Nov 8
Lab courses ... p 4 Aug 23

ELECTROLUMINESCENCE
Air Force display selects data from 1,890 channels ... p 10 Oct 18
Breakthrough in light amplifier, - el-pc image intensifier uses control-grid ... p 30 Sep 20
Consumer electronics Pt II: Home and auto controls ... p 52 May 10
Large displays: military market now, civilian next ... p 24 Jan 25
Solid panel amplifies images ... p 20 May 24
Thin-film photocells get brighter faster ... p 99 Sep 6

ELECTRON BEAMS
Construction of electron-beam space welder begins ... p 30 Jul 19
Electron Beam Symposium: Microwelding - laser or electron beam? ... p 23 Jul 5
Electron beam welding solves relay sealing problems ... p 90 Jun 28
Electrons work tiny ferrites ... p 72 Nov 15
Generator for one-millimeter waves - Tornadotron ... p 21 Aug 16
Infrared Tv tube uses new principle ... p 48 Sep 13
New millimeter wave device - beam-plasma amplifier ... p 40 Nov 8
Novel bwo doesn't use magnet ... p 47 Sep 27
Screen mesh factors affect electron beams ... p 62 Nov 15
Simulating tactical radar and sonar ... p 25 Dec 13

ELECTRONIC MUSIC
Consumer electronics Pt I: Entertainment ... p 49 May 3

ENCAPSULATION
Encapsulating precision antennas in plastic ... p 68 Mar 8
Epoxy pellets improve diode production ... p 64 Jul 26

EPITAXIAL TECHNIQUES
High speed integrated circuits with load-compensated diode-transistor logic ... p 68 Mar 15

EPOXIES
Epoxy pellets improve diode production ... p 64 Jul 26

F

FACSIMILE
First color facsimile transmitted by satellite ... p 51 May 24

FERRITE DEVICES
Electrons work tiny ferrites ... p 72 Nov 15
Tunnel diodes Pt II: Amplifiers working beyond transistor capabilities ... p 68 Jun 21
Waffle iron shape booths memory ... p 50 Mar 1
What you must know to use ferrites at low frequencies ... p 38 Mar 1

FIBER OPTICS
Fiber optics, servo built into tape handler ... p 66 Feb 22
Glass-fiber array produces many beams ... p 28 Nov 1
Light beam controls potentiometers ... p 76 Jun 28
Optical computers approach reality ... p 72 May 3

FIELD EFFECT TRANSISTORS
Highlights of small-signal circuit design ... p 46 Dec 6
New field effect device may aid integrated circuit design ... p 44 Nov 29
Novel field-effect device provides broadband gain ... p 30 Nov 1
Simple circuits measure FET parameters ... p 34 Aug 23
Ssb system goal is 20-year life ... p 75 Oct 25

FILTERS
Coaxial filters - a practical design technique ... p 35 Aug 30
Couplers kill reflected RFI ... p 75 Nov 8
Digital correlator detects voice fundamental ... p 28 Nov 22
Now you can use nonreciprocal devices at low frequencies ... p 56 Feb 22
Ultrasonics state-of-the-art report ... p 33 Oct 18

FOREIGN ELECTRONICS
Crosstalk: Microelectronics abroad ... p 3 Aug 2
Down Under - suddenly Mecca for radio men ... p 20 Jan 4
Electronics markets 1963 ... p 43 Jan 4
Europe's color-Tv competition ... p 22 Aug 2
F-104G: boon to Europe ... p 16 Jun 21
French reveal new field-effect structure ... p 56 Jun 14
French Tv spurred by new stations ... p 47 Sep 20
Hot line: for cool nuclear decisions ... p 18 Jun 28
Investment abroad rising ... p 17 Sep 6
Japan debunks reports on color-Tv production ... p 18 Nov 1
Japan's two-tube color camera ... p 28 Jun 7
Japanese exports keep climbing ... p 45 May 3
Microelectronics around the world ... p 37 Aug 2
Russian metrology - it looks as good as ours ... p 27 Jul 26
Soviets planning transmission from Mars ... p 18 Jan 11
Trade Expansion Act: help or hazard? ... p 28 Mar 8
West still leads East in electronics ... p 22 Apr 5
Will British TWT's make further inroads? ... p 50 Jul 12

FREQUENCY ALLOCATIONS
ITU agrees on space allocations ... p 17 Nov 15
ITU allocations: final list ... p 14 Nov 22
Vital band freed for radio astronomy ... p 18 Nov 8

FREQUENCY MEASUREMENT
Binary frequency sensing measures a single pulse ... p 42 Apr 5
F-m discriminator without tuned circuits ... p 36 Nov 29
Low-cost circuit measures frequency translation ... p 51 Nov 8
Sweep measurements - making the tough ones easy ... p 52 Apr 19
Symposium: Frequency control lags ssb ... p 16 Jun 7
Thin films: automatic deposition control ... p 33 Mar 29
Two-phase oscillator covers 0.1 to 1,000-cps ... p 27 Oct 4
Unique frequency comparator has sense of direction ... p 36 Mar 1

FREQUENCY MODULATION
Consumer electronics Pt I: Entertainment ... p 49 May 3
Fitting a wide-band signal into a narrow-band receiver ... p 47 Mar 8
F-m discriminator without tuned circuits ... p 36 Nov 29
F-m feedback stabilizes airborne solid-state VHF transponder ... p 66 Dec 6
Gated pulses yield selected frequency output ... p 38 Dec 20
Latest field-mapping improvement - lead-less transceiver probe works underwater ... p 56 Jul 19
New aerospace transmitter packs 3-watts in fist-sized can ... p 52 Jan 18
Operating X-band tunnel diodes at Q-band ... p 32 Dec 27
Servo tracks pill in human body ... p 58 Mar 22
Wireless mikes get F-M band ... p 26 Jun 28

FREQUENCY MULTIPLIERS
Frequency septupler provides stable 420-cps voltage ... p 58 May 3
Highlights of small-signal circuit design ... p 46 Dec 6
How to design solid-state microwave generators ... p 23 Oct 11

G

GENERATORS
Developing true solid-state static alternators ... p 58 May 24
Sequence pulse generator saves transistors ... p 44 Aug 2

GUIDED MISSILES
Army protects missiles against stray r-f ... p 16 Apr 5
Computer runs missile tracker ... p 12 Jun 14
Conical scan array uses variable phase shifters ... p 30 Nov 39
Long-range spectrometer seeks missile defense clues ... p 16 May 10
Measuring missile antenna impedance in flight ... p 36 Jul 12
Microcomputer comes off the line ... p 14 Nov 1
New infrared system tracks missiles against bright Florida sky ... p 39 Apr 19
New techniques pay off for Polaris fire-control system ... p 61 Oct 25
Predetection recording: Solution to the tel-emetry dilemma? ... p 30 Sep 13
Shrike will be "big buy" ... p 26 Jun 14
Tv camera tracker - can it detect missile decoys? ... p 51 Apr 26
Zeus may never defend cities ... p 24 Mar 8

H

HALL EFFECT
Analog ratio computer uses Hall multiplier ... p 46 Nov 8
Electronics color codes ... p 37 Nov 15
Hall-effect devices may find wide use ... p 51 Nov 22
Now you can use nonreciprocal devices at low frequencies ... p 56 Feb 22
Standards urged for Hall effect devices ... p 47 Jul 5

HIGH FIDELITY See Audio

I

IMAGE INTENSIFIERS See Light Amplifiers

INDUSTRIAL ELECTRONICS
Electronics market 1963 ... p 43 Jan 4
ISA: Safer power plants: why not? ... p 38 May 24
Mesucora: French control systems sophisticated, as usual ... p 14 Nov 29
Transistors control trains ... p 10 Sep 27

INFORMATION RETRIEVAL
Crosstalk: Information: the whole picture ... p 3 May 31
How to quiz a whole memory at once ... p 43 Nov 15
TVIST: new look in photoelectric storage tubes ... p 74 Jun 21

INFRARED
Diode lamp makes tape readers faster ... p 44 May 17
Comment ... p 4 Jul 26
Infrared inspection promises to assure production reliability ... p 62 Jun 14
Infrared mine detector a reality ... p 54 Aug 2
Infrared system detects intruders ... p 26 Aug 16
Infrared Tv tube uses new principle ... p 48 Sep 13
Modulated infrared diode spans 30 miles ... p 38 Apr 5
NEC: Electronics in the Midwest ... p 31 Oct 25
New infrared system tracks missiles against bright Florida sky ... p 39 Apr 19
No-chop IR detector cuts size ... p 28 May 24

INSTRUMENTS
Hybrid voltmeter avoids aging errors ... p 41 Sep 20
IEEE: Instruments extend operating ranges, are easier to work ... p 33 Mar 15
ISA: Telemetry on muscle power ... p 14 Sep 20
Nuclear instruments near picosecond working speed ... p 43 Dec 13
RFI - causes, effects, cures ... p 37 Jun 21
Comment ... p 4 Aug 30
Two-phase oscillator covers 0.1 to 1,000-cps ... p 27 Oct 4

INTEGRATED CIRCUITS
British Show: Microcircuits are busting out in Britain ... p 60 Jun 7
Choosing logic for microelectronics ... p 23 Oct 4
Compatible techniques for integrated circuits ... p 82 May 3
Family tree of semiconductors ... p 45 Apr 26
Flip chips easier to connect ... p 82 Oct 18
High speed integrated circuits with load-compensated diode-transistor logic ... p 68 Mar 15
IEEE: Microcircuits graduate into hardware products ... p 38 Mar 15
IEEE Solid State Conference: New laser structure drives output past 1 w ... p 24 Jun 21
Integrated-circuit oscillator requires few components ... p 40 Dec 13
Integrated circuits go operational ... p 26 Feb 15
Latest approach to integrated amplifier design ... p 24 May 31
Microelectronic Laran-C will fly next year ... p 22 Jun 28
Microelectronics around the world ... p 37 Aug 2
Modules incorporate integrated circuits ... p 78 May 24
New circuit board planned for Apollo accomodates integrated circuit blocks ... p 84 Jun 21
New device simplifies power supply design ... p 39 May 17
New field effect device may aid integrated circuit design ... p 44 Nov 29
Optical soldering promotes automated packaging ... p 90 Mar 22
Parasitic in integrated circuits: more trouble than meets the eye ... p 32 Jul 5
Trends in logic circuit design ... p 38 Dec 6
WESCON: technical highlights ... p 49 Aug 9
When will integrated circuits go civilian? Good guess: 1965 ... p 22 May 10

INTERFERENCE
Can RFI control prevent weapons failures? ... p 43 Nov 8
Couplers kill reflected RFI ... p 75 Nov 8
Crosstalk: What price RFI control? ... p 3 Jun 14
Designing radar receivers to overcome jamming ... p 50 May 17
The high fences at White Sands ... p 64 Oct 18
RFI - causes, effects, cures ... p 37 Jun 21
Comment ... p 4 Aug 30
RFI: In microcircuits it's different ... p 28 Jun 14
Radio-interference control ... p 56 Apr 26
Comment ... p 4 Jun 7
Radio receiver detects faulty parts or joints ... p 86 Oct 18

INVERTERS
Power and control circuits ... p 51 Dec 6

J

JAMMING See Countermeasures

K

KLYSTRONS
Low-noise c-w klystron oscillators meet doppler radar requirements ... p 85 Dec 6
Phase-locked klystrons simulate doppler radar ... p 44 Apr 19

Secondary emission makes klystron tubes self quenching ..... p 40 Oct 18
UHF transmitter operates by remote control ..... p 61 Aug 2

L

LAMPS
Diode lamp makes tape readers faster ..... p 44 May 17
Comment ..... p 4 Jul 26
Will neon photoconductors replace relays in low-speed logic ..... p 46 May 10

LASERS
Aerospace Conference: Air Force outlines latest R & D plans ..... p 16 May 24
Chelate lasers are coming on strong ..... p 32 Apr 26
Danger - reflected laser beams ..... p 7 Aug 9
Designing lasers with pump-power charts ..... p 23 Dec 27
Diode lases at 5.2 microns ..... p 19 Nov 1
Electrochemical Society Symposium: Bright future seen for organics ..... p 51 Oct 11
Electron Beam Symposium: Microwelding - lasers or electron beam? ..... p 23 Jul 5
First color photos show active region in visible-light diode laser ..... p 35 Mar 1
Future keyed to materials properties ..... p 66 Sep 6
GaAs laser transmits wideband data ..... p 24 Oct 18
Gas laser applied to inspecting large optics ..... p 38 Aug 16
Gas laser for optical radar ..... p 59 Sep 20
Gatling-gun laser - novel approach to optical radar ..... p 25 Sep 20
Giant ruby laser produces harmonics ..... p 60 May 10
Helium-neon laser averages 1-w output ..... p 19 Sep 20
How rare earth chelate lasers work ..... p 67 Nov 15
IEEE Solid State Conference: New laser structure drives output past 1 w ..... p 24 Jun 21
Injection laser systems for communications tracking ..... p 35 Dec 13
Injection lasers ..... p 61 Dec 6
Kerr-effect readout uses gas laser ..... p 48 Apr 5
Laser beam carries Tv video and audio ..... p 28 Feb 22
Laser may accelerate computer ..... p 39 Oct 4
Laser may find new role in navigation ..... p 7 Feb 8
Comment ..... p 4 Apr 19
Laser meetings double up ..... p 22 Apr 12
Laser pulses track targets ..... p 64 Oct 18
Laser used to confirm physical standards ..... p 74 Mar 22
Laser welds copper leads ..... p 88 Oct 25
Lasers fill medical needs ..... p 30 Apr 19
Lasers last week: more colors, more power ..... p 7 Aug 23
MIT laser detects meteoric fragments ..... p 78 Oct 25
Measuring laser output with rat's nest calorimeter ..... p 36 Feb 1
The medical laser: new tool for cancer research ..... p 15 Aug 16
NASA studies earth-space-earth laser links ..... p 22 May 10
NEC: Electronics in the Midwest ..... p 31 Oct 25
NEREM: Research in New England ..... p 23 Nov 1
Neodymium-glass amplifier for lasers ..... p 42 Dec 13
Nonlinear effects convert laser beam, amplify light ..... p 30 May 3
Now lasers are industrial tools ..... p 16 Mar 29
One GaAs laser is quenched by another ..... p 57 Jul 26
The optical heterodyne - key to advanced space signaling ..... p 29 Jul 12
Pulse power supply design for laser pumping ..... p 33 Dec 20
Quantum Electronics' Symposium: what's new in lasers? ..... p 14 Mar 1
Raman scattering explains liquid lasers ..... p 74 Feb 15
Russia tries gamma-ray laser ..... p 11 Oct 4
Comment ..... p 6 Nov 22
Servo controls helium-neon gas laser output ..... p 58 Mar 8
Silicon-carbide laser emits blue light ..... p 17 Sep 6
Society of Photographic Instrumentation Engineers symposium: From flash guns to lasers ..... p 16 Aug 16
Solid-State Conference: solid progress in solid-state seen at Philadelphia ..... p 12 Mar 1
Symposium: field modulates laser ..... p 26 Apr 26
Comment ..... p 4 Jun 28
Thermoplastic video tape ready soon ..... p 54 Jul 26
Try for triode lasers ..... p 32 May 24
Undersea coherent light ..... p 30 Feb 22
The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
WESCON: technical highlights ..... p 49 Aug 9
Will lasers protect our cities against ICBM's? ... p 20 May 3
Will lasers weld circuit components? ..... p 54 Jul 12

LIGHT AMPLIFIERS
Breakthrough in light amplifiers - el-pc image intensifier uses control-grid ..... p 30 Sep 20
Solid panel amplifies images ..... p 20 May 24

LOGIC CIRCUITS
Advances in microminiaturization ..... p 45 Feb 15
Choosing logic for microelectronics ..... p 23 Oct 4
Circuit trends in nanosecond switching ..... p 35 Sep 20
Components that learn and how to use them ..... p 49 Mar 22
Computers in the front lines: micromodules make it possible ..... p 77 Jan 4
Designing data registers with simple diode circuits ..... p 48 Feb 22
Designing digital equipment with semiconductor networks ..... p 35 Jan 18
High speed integrated circuits with load-compensated diode-transistor logic ..... p 68 Mar 15
High-speed production checking of logic wiring ..... p 56 Mar 29
How to achieve majority and threshold logic with semiconductors ..... p 23 Nov 29
A key to nanosecond switching combining tunnel and charge-storage diodes ..... p 42 Oct 18
Latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
Logic principles for multi-emitter transistors .... p 25 Sep 13
One-stage scaler needs no complex feedback .... p 32 Sep 27
Put more snap in logic circuits with field-effect transistors ..... p 43 Jun 14
Saving microcircuit power with tunnel-diode coupling ..... p 30 Aug 23
Sub system goal is 20-year life ..... p 75 Oct 25
Thin magnetic films create logic circuits ..... p 62 Feb 22
Transistor-transistor logic circuits ..... p 54 Mar 22
Trends in logic circuit design ..... p 38 Dec 6
Tunnel diodes Pt IV: Logic and switching circuits ..... p 26 Jul 5
Tunnel diodes boot TRL speed ..... p 50 May 10
Tunnel resistor - new device to speed up tunnel diodes ..... p 42 Jul 12
Using the latest semiconductor circuits in a UHF digital converter ..... p 37 Aug 30
Will neon photoconductors replace relays in low-speed logic? ..... p 46 May 10

LOUDSPEAKERS
Consumer electronics Pt I: Entertainment ..... p 49 May 3
Comment ..... p 4 Jul 5
Electronics color codes ..... p 37 Nov 15

M

MACHINE TRANSLATION
Computer translates Chinese into English ..... p 56 Jun 7

MAGNETIC RECORDING
Developing radiation-proof space equipment .... p 70 Aug 9
Fiber optics, servo built into tape handler ..... p 66 Feb 22
Magnetic strip keeps tape running true ..... p 42 Jan 11
Now a talking computer answers inventory inquiries ..... p 30 Aug 16
Telcan - 2 U.S. firms compete for rights ..... p 7 Aug 16

MAGNETICS
(See also Ferrite Devices; Superconductivity)
Components that learn and how to use them ..... p 49 Mar 22
Continuous readout of magnetic cores ..... p 38 Sep 6
Foils get thinner, more versatile ..... p 60 Jul 26
French find 7 lucky number ..... p 28 Aug 2
Generator for one-millimeter waves - Tornadotron ..... p 21 Aug 16
INTERMAG: Packing a half-million bits in a cubic inch ..... p 58 Apr 19
Latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
Magnetic field rotates ultrasonic waves ..... p 64 Jan 25
Multi-quantum conversion shown ..... p 50 Sep 20
National Magnet Lab pushes for 250 kgauss .... p 56 May 17
Neglected precision circuits: magnetically coupled multivibrators ..... p 42 Mar 29
Nonlinear effects convert laser beam, amplify light ..... p 30 May 3
Semipermanent memory: latest use for twistors ..... p 80 Mar 15
Sparks shape Alnico magnets ..... p 60 Sep 13
Superconducting magnets head for 100,000 gauss ..... p 18 Mar 1
Thick-film memory has high output ..... p 40 Nov 1
Thin magnetic films create logic circuits ..... p 62 Feb 22
TWT uses new focusing concept ..... p 80 Jun 28
Watch magnets find new uses ..... p 82 Oct 25
What you must know to use ferrites at low frequencies ..... p 38 Mar 1

MAGNETOHYDRODYNAMICS
MHD Conference: plasma accelerator work shows promise ..... p 38 Apr 26

MAGNETOSTRICTION
Components that learn and how to use them ..... p 49 Mar 22
What you must know to use ferrites at low frequencies ..... p 38 Mar 1

MAGNETRONS
Sparks shape Alnico magnets ..... p 60 Sep 13

MAINTENANCE See Servicing

MARINE ELECTRONICS
How Navy flies ASW boats ..... p 14 Jul 5
Latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
Navy's new ship program calls for more electronics ..... p 10 Oct 4
Sea drone snares capsules ..... p 18 Aug 16

MARKETING See Business

MASERS
Field-operational S-band maser ..... p 48 Mar 29
High-frequency optical phonon masing reported ..... p102 Jan 4
Ultrasonics state-of-the-art report ..... p 33 Oct 18

MATCHING
Circuit with a twist: the cascade follower ..... p 69 Dec 6
How to get maximum input impedance with field-effect transistors ..... p 44 Mar 8
Multicoupler puts five transmitters on one antenna ..... p 33 Dec 13
Operating X-band tunnel diodes at Q-band .... p 32 Dec 27
Versatile R-F monitor shows power and VSWR ... p 44 Mar 29

MATERIALS
How rare earth chelate lasers work ..... p 67 Nov 15
Materials for space-age electronics ..... p 37 Oct 25

MEASUREMENTS
Automatic computer identifies color ..... p 44 Sep 27
Automatic system probes B-70 stresses ..... p 44 Jul 5
Binary frequency sensing measures a single pulse ..... p 42 Apr 5
Designing lasers with pump-power charts ..... p 23 Dec 27
Digital correlator detects voice fundamental .... p 28 Nov 22
Dynamic null - new method for measuring equipment performance ..... p 78 Mar 15
Comment ..... p 4 May 3
Easy-to-use chart for VSWR ..... p 38 Nov 22
Easy ways to make microwave phase measurements ..... p 50 Mar 8
Electromechanical timer for lab application .... p 78 Feb 15
Fresh approach to measuring transistor beta ..... p 47 Jul 26
Getting subnanosecond precision in coax cable delay measurements ..... p 39 Feb 1
How to measure field patterns with photosensitive probes ..... p 39 Jan 25
Hybrid voltmeter avoids aging errors ..... p 41 Sep 20
IEEE: Instruments extend operating ranges, are easier to work ..... p 33 Mar 15
Inductive telemetry improves spin-system measurements ..... p 41 Nov 15
Laser used to confirm physical standards ..... p 74 Mar 22
Latest field-mapping improvement - lead-less transceiver probe works underwater ..... p 56 Jul 19
Low-cost circuit measures frequency translation . p 51 Nov 8
Measuring laser output with rat's nest calorimeter ..... p 36 Feb 1
Measuring missile antenna impedance in flight ..... p 36 Jul 12
Microwave radiation probes shock plasma ..... p 56 Jan 18
New microwave power meter ..... p 48 Mar 29
Novel test techniques measure Q in cryogenic resonant circuits ..... p 43 Feb 22
Phosphors trace heat flow patterns ..... p 40 Aug 23
Practical way to measure transistor thermal resistance ..... p 66 Feb 15
Comment ..... p 4 Jun 14
Quick way to find beta (h-FE), alpha (h-FB), and (h-FC) ..... p 64 Aug 9
RFI - causes, effects, cures ..... p 37 Jun 21
Comment ..... p 4 Aug 30
Racing the solar eclipse ..... p 37 Jul 26
Rapid method measures diode characteristics .... p 50 Jun 14
Reactor monitor ..... p 30 Dec 6
Reducing winter skids with a transistor warning circuit ..... p 56 Jan 25
Russian metrology - it looks as good as ours .... p 27 Jul 26
Simple circuits measure FET parameters ..... p 34 Aug 23
Slow sampling saves time ..... p 40 Nov 29
Standardizing noise-figure measurement ..... p124 Jan 4
Sweep measurements - making the tough ones easy ..... p 52 Apr 19
Symposium: What happens to dielectrics in space? ..... p 68 Jul 19
Thin films: automatic deposition control ..... p 33 Mar 29
Tunnel diode detects currents down to 100 femtoamperes ..... p 33 Apr 5
Comment ..... p 4 Apr 26
Unique bridge measures antenna operating impedance ..... p 51 Feb 22
Unique frequency comparator has sense of direction ..... p 36 Mar 1
Unusual waveform analyzer aids automatic testing ..... p 56 Apr 12
VHF counter measures time intervals precisely ... p 27 Aug 23
Versatile R-F monitor shows power and VSWR ... p 44 Mar 29

Voltage monitor needs only two saturable cores ... p 50 Jun 7

MEDICAL ELECTRONICS
Biotelemetry: prime space need ... p 20 Feb 22
Can synthetic sleep save time? ... p 20 May 24
Computer analyzes x-rays ... p 38 Nov 1
Computer diagnoses heart disease ... p 80 Dec 6
Computers pace progress in medical humanetics.. p 10 Oct 11
Designing a simple telemeter for medical research ... p 47 Jan 25
Implanted radio aids paraplegics ... p 17 Nov 1
Lasers fill medical needs ... p 30 Apr 19
The medical laser: new tool for cancer research.. p 15 Aug 16
Muscle voltage moves artificial hand ... p 34 Oct 11
New transducers at biomedical meeting ... p 60 May 10
Portable electronic muscle exerciser nears production ... p 16 Jul 12
Servo tracks pill in human body ... p 58 Mar 22

MEMORIES
Components that learn and how to use them ... p 49 Mar 22
FJCC: What's new in computer memories ... p 35 Nov 8
How to quiz a whole memory at once ... p 43 Nov 15
IEEE: Conductive memory points to new displays . p 10 Nov 8
INTERMAG: Packing a half-million bits in a cubic inch ... p 38 Apr 19
Kerr-effect readout uses gas laser ... p 48 Apr 5
Metal sheets memory operates independent of temperature ... p 16 Jul 12
New device lowers memory element cost ... p 25 Jul 12
New digital conversion method provides nanosecond resolution ... p 55 May 3
Plated holes simplify memory design ... p 34 Nov 1
Semipermanent memory: latest use for twistors ... p 80 Mar 15
Thick-film memory has high output ... p 40 Nov 1
Thin-film memory might cost 0.3 cent per bit ... p 44 Nov 22
Thin magnetic films create logic circuits ... p 62 Feb 22
Tunnel diodes Pt IV: Logic and switching circuits ... p 26 Jul 5
TVIST: new look in photoelectric storage tubes ... p 74 Jun 21
Waffle iron shape boosts memory. ... p 50 Mar 1
Will solid state nip relay markets? ... p 66 May 10

METEOROLOGY
More target data with sideband coherent radar ... p 40 Jan 18
Comment ... p 4 Mar 29
Need weather data? Buy a satellite ground station ... p 20 Jul 26
New approach to weather data: every plane a station ... p 38 Jul 12
Special computer integrates rainfall ... p 70 May 24
WESCON: Technical highlights ... p 49 Aug 9

MICROELECTRONICS
(See also Integrated Circuits)
Advances in microminiaturization ... p 45 Feb 15
British Show: Microcircuits are busting out in Britain ... p 60 Jun 7
Ceramic substrate improves microcircuit reliability ... p 51 Nov 22
Choosing logic for microelectronics ... p 23 Oct 4
Circuit trends in nanosecond switching ... p 35 Sep 20
Computers in the front lines: micromodules make it possible ... p 77 Jan 4
Crosstalk: Microelectronics abroad ... p 3 Aug 2
Designing digital equipment with semiconductor networks ... p 35 Jan 18
Foils get thinner, more versatile ... p 60 Jul 26
IEEE: Microcircuits graduate into hardware products ... p 38 Mar 15
IEEE topics ... p132 Mar 15
The impact of microelectronics ... p 51 Jun 28
Inductors no problem: new thin-film amplifier ... p 46 Jun 7
Microcomputer comes off the line ... p 14 Nov 1
Microelectronics around the world ... p 37 Aug 2
Micropower circuits - new frontier in solid state ... p 47 Jul 19
Module production quality assured by thermal cycling and life testing ... p 92 Jul 19
Modules incorporate integrated circuits ... p 78 May 24
NEC: Electronics in the Midwest ... p 31 Oct 25
Navy pushes microcircuits Reason: technician shortage ... p 34 Jun 28
Navy report defines microcircuit functions ... p 63 Aug 2
Optical coupling: new approach to microcircuit interconnections ... p 23 Nov 22
Optical soldering promotes automated packaging ... p 90 Mar 22
RFI: In microcircuits it's different ... p 28 Jun 14
Self-setting parallel-gap welder for microcircuits ... p 91 Dec 6
Solid-state ion implants forge tailor-made junctions ... p 26 Apr 19
System packaging uses book configuration ... p 56 Apr 5
Transfer process avoids P-C open circuits ... p 68 Jan 18
Using microcircuits in high-resolution range counters ... p 31 Nov 22
Using microcircuits in micromodules ... p 86 Jul 19
Vacuum Symposium: Modulated beams build microcircuits ... p 26 Oct 25
WESCON: Micro-packaging for microelectronics ... p 88 Aug 9

MICROMODULES See Microelectronics

MICROPHONES
AES: Foil stabilizes electret mike ... p 68 Oct 25
Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
Electronics color codes ... p 37 Nov 15
Wireless mikes get F-M band ... p 26 Jun 28

MICROPOWER TECHNIQUES
Micropower circuits - new frontier in solid state ... p 47 Jul 19
Micropower devices are going to nanopower level ... p 38 Jun 28
Micropower goes international ... p 46 Jul 5

MICROWAVES
(See also Millimeter Waves)
Avalanching transistor generates microwaves .... p 35 Oct 25
ESP: is biological radio communication possible? ... p 14 Mar 29
Comment ... p 4 May 10
How to design solid-state microwave generators ... p 23 Oct 11
Microwave tubes get cheaper, less noisy ... p 52 Dec 13
New microwave power meter ... p 48 Mar 29
Waveguide telemeters space-chamber data ... p 74 Jun 28
Window materials for high-power microwave tubes ... p 40 May 31

MILITARY ELECTRONICS
Air Force plans net to survive nuclear attack.... p 28 Mar 22
Air Force research aim: detection capabilities... p 72 Apr 26
Air/ground teams seek new systems ... p 15 Aug 23
Army demands new electronics techniques ... p 20 Jul 12
Army of the air creates new market ... p 32 Apr 12
Army wants surveillance, armament gear for air arm ... p 10 Nov 29
Atomic test ban - what does it mean to our industry? ... p 18 Aug 2
Crosstalk: Believe it or not ... p 3 Mar 29
Disarmament - what chance? what impact?... p 56 Sep 6
Electronics industry nudges fourth place nationally ... p 18 Jul 5
Electronics market 1963 ... p 43 Jan 4
Military electronics will level off in fiscal 1964. p 18 Jan 25
Military radio swinging to sub ... p 29 Apr 5
National Military Command system moves forward ... p 20 Apr 26
Side-looking radar makes maps in flight ... p 22 Mar 22
Spacecom: $100-million-a-year market ... p 22 Apr 19
Stand by for those Navy RDT&E contracts: $1 1/2 billion ... p 10 Sep 13
VE now the rule ... p 46 Sep 13

MILLIMETER WAVES
Generator for one-millimeter waves - Tornadotron ... p 21 Aug 16
High power at millimeters - plasma harmonics the key ... p 16 Aug 30
IRE Millimeter Conference: try developing MM components ... p 24 Jan 18
Microwave radiation probes shock plasma ... p 56 Jan 18
Microwave tubes get cheaper, less noisy ... p 52 Dec 13
Multi-quantum conversion shown ... p 50 Sep 20
Near-field plotter: design tool for millimeter-wave antennas ... p 29 Dec 27
New millimeter components and techniques .... p 33 Jan 11
New millimeter wave device - beam-plasma amplifier ... p 40 Nov 8

MINIATURIZATION
(See also Microelectronics)
Miniature components aimed for mass markets ... p 64 Apr 19

MISSILES See Guided Missiles

MIXERS See Converters

MODULATORS
Delta modulator codes television waveguide link ... p 50 Aug 2
NEREM: Research in New England ... p 23 Nov 1
New modulation technique simplifies circuits ... p 52 Jan 25
The PIN diode: versatile microwave component ... p 40 Mar 8
Pulse-width modulator offers precision performance ... p 29 Oct 11
Pulses promise simpler audio ... p 16 Aug 16
Simple transistor modulators improve sideband communications ... p 54 Mar 8
Solid crystal modulates light beams ... p 58 Dec 20
Symposium: field modulates laser ... p 26 Apr 26
Comment ... p 4 Jun 28
Three new approaches to pulse modulation ... p 62 May 3
Two-state modulation simplifies audio circuits... p 36 Aug 23
Unijunction transistor simplifies voltage-frequency converter ... p 56 Oct 25

MOTOR CONTROL
Electronics color codes ... p 37 Nov 15
Transistors control trains ... p 10 Sep 27
Will r-f control artificial hearts? ... p 86 Jun 21

MULTIVIBRATORS
Basic rules for designing reliability into semiconductor circuits ... p 62 Apr 12
Crystal-controlled multivibrator has better stability ... p 60 Apr 12
Comment ... p 4 May 17
Designing NRE monostable multivibrators ... p 34 Sep 13
Developing radiation-proof space equipment .... p 70 Aug 9
Latest multivibrator improvement - linear voltage-to-frequency converter ... p 64 Apr 26
Neglected precision circuits: magnetically coupled multivibrators ... p 42 Mar 29
Simple counter tester uses cascaded one-shots ... p 40 Apr 5
Using a new component: the NRE as a free-running multivibrator ... p 50 Jul 26
Vacuum deposited circuits use field effect ... p 80 Apr 12

N

NAVIGATION SYSTEMS
Doppler sonar plots ship's course ... p 14 Nov 22
Navy's new ship program calls for more electronics ... p 10 Oct 4

NEGATIVE RESISTANCE
Designing NRE monostable multivibrators ... p 34 Sep 13
How to make tunnel diodes even more useful .... p 52 Jun 7
The negative resistance element (NRE): a new circuit component ... p 21 May 31
Design of D-C switches with negative resistance elements ... p 32 Jul 12
Using a new component: the NRE as a free-running multivibrator ... p 50 Jul 26
Comments p 4 Jul 5, p 4 Jul 12,... p 4 Jul 19
Raising tank-circuit Q with the NRE... p 30 Oct 4
Secondary emission makes klystron tubes self quenching ... p 40 Oct 18

NEON DEVICES
Consumer electronics Pt II: Home and auto controls ... p 52 May 10
Will neon photoconductors replace relays in low-speed logic ... p 46 May 10

NETWORKS
Experimental neuristor gives nerve-like pulse propagation ... p 25 Mar 1
F-m discriminator without tuned circuits... p 36 Nov 29
IEEE: ultra-intelligent machines by year 2000 ... p 46 Mar 1
Multicoupler puts five transmitters on one antenna ... p 33 Dec 13
Now you can use nonreciprocal devices at low frequencies ... p 56 Feb 22

NEURISTORS
Aerospace Conference: Air Force outlines latest R & D plans ... p 16 May 24
Experimental neuristor gives nerve-like pulse propagation ... p 25 Mar 1
Optical computers approach reality ... p 72 May 3

NOISE
Cut-out slide rule simplifies noise calculations ... p 64 Feb 8
Designing input circuits with lowest possible noise ... p 46 Aug 2
Fail-safe squelch circuit adapts to changing noise levels ... p 88 Jan 4
How to choose transistors for low noise ... p 50 Jan 11
Low-noise preamplifier uses field-effect transistors ... p 67 Apr 12
Comment ... p 4 Jun 21
RFI - causes, effects, cures ... p 37 Jun 21
Comment ... p 4 Aug 30
Rapid evaluation of complex receiving systems ... p 44 Feb 1
Standardizing noise-figure measurement ... p124 Jan 4

NOMOGRAPHS
Cut-out slide rule simplifies noise calculations ... p 64 Feb 8
Communications range nomograph ... p 41 Dec 20
Nomograph speeds amplifier design ... p 38 Jul 5
Quick way to find beta (h-FE), alpha (h-FB), and (h-FC) ... p 64 Aug 9
Rapid evaluation of complex receiving systems ... p 44 Feb 1
Recent tests show tropo scatter better than believed ... p 42 Mar 1

NUCLEONICS
Atomic test ban - what does it mean to our industry? ... p 18 Aug 2
Black box blast detection - hope or hoax? ... p 26 Jan 4
Blast signatures - key to test ban treaty ... p 24 Feb 22
How radio can plot high-altitude nuclear blasts ... p 28 Jan 11
New underwater gamma spectrometer ... p 56 Mar 8
Nuclear blast effects on communications ... p 74 Feb 8
Nuclear instruments near picosecond working speed ... p 43 Dec 13
Probes can take nuclear blasts ... p 78 Aug 9
Radioactive source generates probabilities ... p 54 Sep 13
Reactor monitor ... p 30 Dec 6
Taking human error out of nuclear experiments ... p 46 Jun 14
Test-ban monitors set for launch ... p 57 Oct 18

O

Editorial Staff

OCEANOGRAPHY See Underwater Electronics

OPTICS
Diode lamp makes tape readers faster ... p 44 May 17
Comment ... p 4 Jul 26
Fiber optics, servo built into tape handler ... p 66 Feb 22
Gas laser for optical radar ... p 59 Sep 20
Gatling-gun laser - novel approach to optical radar ... p 25 Sep 20
High-frequency optical phonon masing reported ... p102 Jan 4
How ceramic benders control light rays ... p 80 Jul 19
Comment ... p 6 Sep 20
IEEE Solid State Conference: Look at what optical semiconductors do now ... p 32 Jun 28
Laser pulses track targets ... p 64 Oct 18
Light beam controls potentiometers ... p 76 Jun 28
Light isolates amplifier stages ... p 43 Nov 1
Modulated infrared diode spans 30 miles ... p 38 Apr 5
New infrared system tracks missiles against bright Florida sky ... p 39 Apr 19
New material improves polarization of light ... p 17 Sep 20
Optical computers approach reality ... p 72 May 3
Optical coupling: key to design freedom ... p 82 Mar 22
Optical coupling: new approach to micro-circuit interconnections ... p 23 Nov 22
The optical heterodyne - key to advanced space signaling ... p 29 Jul 12
Optical radar for space rendezvous ... p 44 Oct 4
Optical soldering promotes automated packaging ... p 90 Mar 22
Raman scattering explains liquid lasers ... p 74 Feb 15
WESCON: technical highlights ... p 49 Aug 9

ORGANIZATIONS
IEEE: The lone nominee - his views ... p 38 Aug 9

OSCILLATORS
(See also Lasers, Signal Generators)
Advanced Clapp oscillator features 3-to-1 dynamic range ... p 60 Feb 22
Avalanching transistor generates microwaves ... p 35 Oct 25
Blocking oscillator has variable width output ... p156 Mar 15
Chemicals affect oscillator output ... p 46 Dec 13
Designing a simple telemeter for medical research ... p 47 Jan 25
Frequency control lags ssb: Symposium ... p 16 Jun 7
Generator for one-millimeter waves - Tornadotron ... p 21 Aug 16
How to design solid-state microwave generators ... p 23 Oct 11
Integrated-circuit oscillator requires few components ... p 40 Dec 13
Low-noise c-w klystron oscillators meet doppler radar requirements ... p 85 Dec 6
More target data with sideband coherent radar ... p 40 Jan 18
Comment ... p 4 Mar 29
Multitone oscillators - new source of simultaneous frequencies ... p 86 Jan 4
Neglected precision circuits: magnetically coupled multivibrators ... p 42 Mar 29
New millimeter components and techniques ... p 33 Jan 11
New phase-tracking demodulator will not lock on sidebands ... p 52 Feb 8
Novel bwo doesn't use magnet ... p 47 Sep 27
Novel feedback loop stabilizes audio oscillator ... p 42 Feb 1
Operating X-band tunnel diodes at Q-band ... p 32 Dec 27
R-F oscillator has improved stability ... p 62 Aug 9
Raising tank-circuit Q with the NRE ... p 30 Oct 4
Resonant-cavity tuning now made easy ... p 46 Jan 18
Secondary emission makes klystron tubes self quenching ... p 40 Oct 18
Thin films: automatic deposition control ... p 33 Mar 29
Tunnel diodes Pt I: Using them as sinusoidal generators ... p 36 Jun 14
Tunnel diodes Pt III: Mixer and converter circuits ... p 60 Jun 28
Comment ... p 4 Aug 2
Two-phase oscillator covers 0.1 to 1,000-cps ... p 27 Oct 4
Using varactors to extend frequency-control range ... p 48 Nov 8

OSCILLOSCOPES
Circuit converts one-trace scopes to raster display ... p 33 Nov 29
Dynamic null - new method for measuring equipment performance ... p 78 Mar 15
Comment ... p 4 May 3

P

PACKAGING
Flip chips easier to connect ... p 82 Oct 18
Kitting cuts assembly errors ... p 46 Aug 30
New package for microtransistor ... p 75 Nov 8

PARAMETRIC AMPLIFIERS
NEREM: Research in New England ... p 23 Nov 1
S-band paramp approaches noise-figure minimum ... p 57 Jun 28
Subaudio parametric amplifier for ocean-bottom seismometer ... p 28 Mar 1
The versatile point-contact diode - how it detects and amplifies laser light ... p 82 Jan 4
Comment ... p 4 Mar 8

PARASITICS
Parasitics in integrated circuits: more trouble than meets the eye ... p 32 Jul 5

PARTICLES
Brookhaven Laboratory finds new anti-particle ... p 39 Aug 23
Multi-quantum conversion shown ... p 50 Sep 20

PATENTS
Big printed-circuit fight: Technograph loses round 1 ... p 24 Jun 7

PHASE MEASUREMENT
Conical scan array uses variable phase shifters ... p 30 Nov 29
Easy ways to make microwave phase measurements ... p 50 Mar 8

PHOTOELECTRIC DEVICES
Aiming a 3-ton telescope hanging from a balloon ... p 47 Feb 8
Are hot cathodes on the way out? ... p 39 Jun 7
Breakthrough in light amplifiers - el-pc image intensifier uses control-grid ... p 30 Sep 20
Diode lamp makes tape readers faster ... p 44 May 17
Comment ... p 4 Jul 26
Diode receives optical signals ... p 17 Sep 13
Family tree of semiconductors ... p 45 Apr 26
GaAs laser transmits wideband data ... p 24 Oct 18
High-speed servo positioner bonds mesa transistors ... p 58 Feb 8
How to measure field patterns with photosensitive probes ... p 39 Jan 25
Light beam controls potentiometers ... p 76 Jun 28
Light isolates amplifier stages ... p 43 Nov 1
New approach to weather data: every plane a station ... p 38 Jul 12
New underwater gamma spectrometer ... p 56 Mar 8
Radiosonde measures after-effects of solar events ... p 47 Apr 19
Thin-film photocells get brighter faster ... p 99 Sep 6
TVIST: new look in photoelectric storage tubes ... p 74 Jun 21
The versatile point-contact diode - how it detects and amplifies laser light ... p 82 Jan 4
Comment ... p 4 Mar 8
Will neon photoconductors replace relays in low-speed logic? ... p 46 May 10

PHOTOGRAPHY
Breakthrough in light amplifiers - el-pc image intensifier uses control-grid ... p 30 Sep 20
CRT recording has wide bandwidth ... p 60 Nov 15
Consumer electronics Pt III: Appliances and housewares ... p 46 May 17
Data on polaroid prints ... p 47 Aug 30
Phosphors trace heat flow patterns ... p 40 Aug 23
Society of Photographic Instrumentation Engineers symposium: From flash guns to lasers ... p 16 Aug 16
Solid-state components shrink photoflash control ... p 70 Apr 12

PLASMA TECHNIQUES
Are hot cathodes on the way out? ... p 39 Jun 7
Electron Beam Symposium: Microwelding - laser or electron beam? ... p 23 Jul 5
High power at millimeters - plasma harmonics the key ... p 16 Aug 30
Homogeneous semiconductors - a new generation of devices ... p 65 Jun 21
MHD Conference: Plasma accelerator work shows promise ... p 38 Apr 26
Microwave radiation probes shock plasma ... p 56 Jan 18
New millimeter wave device - beam-plasma amplifier ... p 40 Nov 8
Plasma metal 'unction generates 29th harmonic ... p 8 Jun 28
Sparking thin films drive plasma engine ... p 40 Jun 28

POTENTIOMETERS
Experts evaluate nonwirewound pots ... p 44 Aug 30
Light beam controls potentiometers ... p 76 Jun 28

POWER SUPPLIES
Accurate gyro balancing ... p 81 Oct 25
Arc-protection circuits ... p 54 Feb 22
Battery for space finds consumer uses ... p 49 Oct 4
Capacitance chargers for space employ controlled rectifiers ... p 32 Oct 11
Comment ... p 6 Nov 1
Computers in the front lines: micromodules make it possible ... p 77 Jan 4
Frequency septupler provides stable 420-cps voltage ... p 58 May 3
Inside the orbiting geophysical observatory ... p 61 Feb 15
New device simplifies power supply design ... p 39 May 17
New way to saturable reactors: stabilizing high-power rectifiers ... p 62 May 24
Overload protection without high power dissipation ... p 36 Mar 29
Power and control circuits ... p 51 Dec 6
Pulse power supply design for laser pumping ... p 33 Dec 20
Silicon rectifier controls power in either direction ... p 63 Dec 20
Supplying low-impedance power for tunnel diodes ... p 60 Jan 18
Thermoplastic video tape ready soon ... p 54 Jul 26

PRINTED WIRING
Better techniques toughen connections on P-C boards ... p 70 May 10
Big printed-circuit fight: Technograph loses round 1 ... p 24 Jun 7
Deplating process makes circuit boards ... p 92 Jun 21
Dips and waves improve soldering ... p 48 Jul 5
Electronic Packaging Conference: Hot-air machine speeds soldering ... p 44 May 31
Etched molds form p-c boards ... p108 Sep 6
Fabrication aids cut submodule rejection rate ... p 68 May 17
Iron or machine can solder printed cables ... p 74 Nov 15
Optical soldering promotes automated packaging ... p 90 Mar 22
Plated holes simplify memory design ... p 34 Nov 1
Preformed circuits reduce joining operations ... p 45 Aug 23
Sintering toughens printed circuits ... p 60 Jan 11
Transfer process avoids P-C open circuits ... p 68 Jan 18
Ultrasonic waves clean circuit boards ... p 86 May 24
Xerography simplifies p-c production ... p 50 Sep 27

PRINTERS
600,000 WPM printer races computer ... p 26 May 24

PRODUCTION TECHNIQUES
Electron beam welding solves relay sealing problems ... p 90 Jun 28
Electrons work tiny ferrites ... p 72 Nov 15
Epoxy pellets improve diode production ... p 64 Jul 26
Fabrication aids cut submodule rejection rate ... p 68 May 17
High-speed servo positioner bonds mesa transistors ... p 58 Feb 8
High-speed production checking of logic wiring ... p 56 May 29
Honeycomb enhances cordwood packaging ... p 94 Feb 15
IEEE topics ... p132 Mar 15
Immersion gold solution used in electroplating ... p100 Feb 15
Inside-diameter saws slice semiconductors ... p 65 Sep 20
Kitting cuts assembly errors ... p 46 Aug 30
Layout machine scribes on glass ... p 52 Oct 4
Machine coats films automatically ... p 86 Apr 26
Machine simplifies bonding process ... p 60 Feb 1
Multiblade saws cut wafering heat ... p 58 Oct 11
Multi-frequency transducers improve ultrasonic cleaning ... p 54 Nov 22
New 40-mm silicon crystals permit larger-capacity devices ... p 84 Feb 8
Notation language speeds production changes ... p 92 May 3
Optical soldering promotes automated packaging ... p 90 Mar 22
PERT aids small runs, too ... p 66 Dec 20
Prototype parts produced efficiently ... p 82 Feb 22
Radial-lead film resistor automatically produced ... p 54 Mar 1
Sparks shape Alnico magnets ... p 60 Sep 13
Spot-testing aids manufacture of high-reliability relays ... p106 Apr 12
Thin-film production performed continuously ... p 70 Apr 19
Thin films: automatic deposition control ... p 33 Mar 29
Versatile winder reduces costs ... p 80 Nov 8
Wetting agent solves photoetching problems ... p 54 Dec 13
Wires cut crystals accurately ... p 46 Nov 1

Xerography simplifies p-c production ..... p 50 Sep 27

PROTECTIVE CIRCUITS
Five-layer diode guards cables ..... p 84 Jun 21
New technique protects receivers from high power ..... p 32 Mar 1
Overload protection without high power dissipation ..... p 36 Mar 29
Versatile R-F monitor shows power and VSWR ... p 44 Mar 29

PULSE TECHNIQUES
(See also Digital Techniques)
Arc-protection circuits ..... p 54 Feb 22
Binary frequency sensing measures a single pulse ..... p 42 Apr 5
Chart gives RLC values for critical damping .... p 34 May 31
Contest produces novel circuit designs ..... p 96 Mar 15
Designing a simple telemeter for medical research ..... p 47 Jan 25
Gated pulses yield selected frequency outputs... p 38 Dec 20
Gatling-gun laser - novel approach to optical radar ..... p 25 Sep 20
Getting subnanosecond precision in coax cable delay measurements ..... p 39 Feb 1
How coded-pulse techniques extend radar range . p 34 Nov 22
Improving pulse rise time with snap-off diodes ..... p 68 Feb 15
Comment ..... p 4 Apr 5
Logarithmic attenuator spans three decades ..... p 47 Nov 15
New underwater gamma spectrometer ..... p 56 Mar 8
One-stage scaler needs no complex feedback.... p 32 Sep 27
Pulse power supply design for laser pumping .... p 33 Dec 20
Pulse-width modulator offers precision performance ..... p 29 Oct 11
Pulses promise simpler audio ..... p 16 Aug 16
Selecting tubes for wide bandwidth ..... p 53 Oct 25
Semipermanent memory: latest use for twistors ... p 80 Mar 15
Sequence pulse generator saves transistors ..... p 44 Aug 2
Tv dissolve wiper ..... p 40 Sep 6
Three new approaches to pulse modulation ..... p 62 May 3
Tunnel resistor - new device to speed up tunnel diodes ..... p 42 Jul 12
Two-state modulation simplifies audio circuits... p 36 Aug 23
Unique synchronizing technique increases digital transmission rates ..... p 75 Mar 15

R

RADAR
Air-sea-sub display plots naval targets ..... p 20 Jun 7
Army wants surveillance, armament gear for air arm ..... p 10 Nov 29
Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
Consumer electronics Pt II: Home and auto controls ..... p 52 May 10
Designing radar receivers to overcome jamming ..... p 50 May 17
Fast agc amplifier locks monopulse radar on target ..... p 34 Sep 27
Gas laser for optical radar ..... p 59 Sep 20
Gatling-gun laser - novel approach to optical radar ..... p 25 Sep 20
The high fences at White Sands ..... p 64 Oct 18
How coded-pulse techniques extend radar range . p 34 Nov 22
How computers align phased-array radars ..... p 29 Nov 15
Long-range spectrometer seeks missile defense clues ..... p 16 May 10
Low-noise c-w klystron oscillators meet doppler radar requirements ..... p 85 Dec 6
Marines to get 3-D radar ..... p 24 May 3
Microwave components ..... p 28 Dec 6
More target data with sideband coherent radar ..... p 40 Jan 18
Comment ..... p 4 Mar 29
Multicomputers to rule English sky ..... p 14 Oct 11
NASA's newest trackers go to Australia ..... p 54 Nov 8
Navy readies airborne data system..... p 43 Sep 20
New air-traffic system predicts flight paths .... p 27 Feb 1
New infrared system tracks missiles against bright Florida sky ..... p 39 Apr 19
Optical radar for space rendezvous ..... p 44 Oct 4
Phase-locked klystrons simulate doppler radar..... p 44 Apr 19
Presenting radar targets in color..... p 54 Oct 18
Pulse radar to guide Gemini ..... p 16 Aug 23
Radar designs acquiring new versatility..... p 10 Sep 20
Shrike will be "big buy" ..... p 26 Jun 14
Side-looking radar makes maps in flight ..... p 22 Mar 22
Simulating tactical radar and sonar ..... p 25 Dec 13
Special computer integrates rainfall ..... p 70 May 24
Stage is set again for RS-70 debate ..... p 19 Feb 1
Comment ..... p 4 Mar 1
Subnanosecond radar shows high resolution ..... p 36 May 31

RADIATION
Bad medicine for semiconductors ..... p 10 Nov 1
Can RFI control prevent weapons failures? ..... p 43 Nov 8
Developing radiation-proof space equipment .... p 70 Aug 9
Diodes tolerate high radiation ..... p 48 Nov 29
Radioactive source generates probabilities ..... p 54 Sep 13
Radiosonde measures after-effects of solar events ..... p 47 Apr 19
Surface effects of ionizing radiation..... p 34 Oct 4
Symposium: What happens to dielectrics in space?..... p 68 Jul 19

RADIO ASTRONOMY
Arecibo-new era in radio astronomy ..... p 29 Dec 20
ARECIBO: world's biggest ear ..... p 18 May 17
Radio astronomy gains frequencies ..... p 17 Sep 27
Vital band freed for radio astronomy ..... p 18 Nov 8

RADIOSONDE
Radiosonde measures after-effects of solar events ..... p 47 Apr 19

RAILROADS
RR's seek traffic aids ..... p 26 Oct 18
Transistors control trains ..... p 10 Sep 27

RECEIVERS
Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12
Binary frequency sensing measures a single pulse ..... p 42 Apr 5
Consumer electronics Pt 1: Entertainment ..... p 49 May 3
Cut-out slide rule simplifies noise calculations ..... p 64 Feb 8
Designing radar receivers to overcome jamming ..... p 50 May 17
Fail-safe squelch circuit adapts to changing noise levels ..... p 88 Jan 4
Fitting a wide-band signal into a narrow-band receiver ..... p 47 Mar 8
First details on Mercury spacecraft command receiver ..... p 32 Feb 1
Miniature components aimed for mass markets ..... p 64 Apr 19
New phase-tracking demodulator will not lock on sidebands ..... p 52 Feb 8
New technique protects receivers from high power ..... p 32 Mar 1
Radio-interference control ..... p 56 Apr 26
Comment ..... p 4 Jun 7
Radio receiver detects faulty parts or joints ..... p 86 Oct 18
Rapid evaluation of complex receiving systems .. p 44 Feb 1
Tunnel diodes Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2

RECORDERS
CRT recording has wide bandwidth ..... p 60 Nov 15
Developing radiation-proof space equipment .... p 70 Aug 9
Electronic pen uses ink instead of electron beam ..... p 51 Sep 13
Fiber optics, servo built into tape handler ..... p 66 Feb 22
Hot mikes will record air crew's conversation ... p 53 Nov 15
Magnetic strip keeps tape running true ..... p 42 Jan 11
Predetection recording: Solution to the telemetry dilemma? ..... p 30 Sep 13
Thermoplastic video tape ready soon ..... p 54 Jul 26

RECTIFIERS
Consumer electronics Pt II: Home and auto controls ..... p 52 May 10
Developing true solid-state static alternators ... p 58 May 24
Electronics color codes ..... p 37 Nov 15
Epoxy pellets improve diode production ..... p 64 Jul 26
Family tree of semiconductors ..... p 45 Apr 26
Immersion gold solution used in electroplating ..... p100 Feb 15
More reliability with controlled avalanche rectifiers ..... p 38 Mar 29
New 40-mm silicon crystals permit larger-capacity devices ..... p 84 Feb 8
New way to saturable reactors: stabilizing high-power rectifiers ..... p 62 May 24
Solid-state components shrink photoflash control ..... p 70 Apr 12

REGULATORS
How diodes keep current to constant value ..... p 74 Jan 25
Overload protection without high power dissipation ..... p 36 Mar 29

RELAYS
Electron beam welding solves relay sealing problems ..... p 90 Jun 28
Spot-testing aids manufacture of high-reliability relays ..... p106 Apr 12
Will solid state nip relay markets? ..... p 66 May 10

RELIABILITY
Basic rules for designing reliability into semiconductor circuits ..... p 62 Apr 12
Can RFI control prevent weapons failures?..... p 43 Nov 8
Checking connector production ..... p 96 Feb 8
If a satellite fails - go up and fix it ..... p 12 May 31
Infrared inspection promises to assure production reliability ..... p 62 Jun 14
Comment ..... p 4 Jun 28
Module production quality assured by thermal cycling and life testing ..... p 92 Jul 19
More reliability with controlled avalanche rectifiers ..... p 38 Mar 29
New approaches to electronic self-repair ..... p 96 Jan 4
New techniques pay off for Polaris fire-control system ..... p 61 Oct 25
Phosphors trace heat flow patterns ..... p 40 Aug 23
Power-transistor circuits - getting both reliability and economy ..... p 54 May 24
Reliability slide rule ..... p 44 Sep 6
Spot-testing aids manufacture of high-reliability relays ..... p106 Apr 12
Sub system goal is 20-year life ..... p 75 Oct 25
Surface effects of ionizing radiation ..... p 34 Oct 4
Underwater testing aids solid-state reliability ... p 93 Oct 25
Which permanent electrical connection should you use? ..... p 50 Jan 25

REPAIRS See Servicing

RESEARCH & DEVELOPMENT
Aerospace Conference: Air Force outlines latest R & D plans ..... p 16 May 24
Air Force upgrades space research microwave center ..... p 28 Jan 25
Chemicals affect oscillator output ..... p 46 Dec 13
How to succeed in business on someone else's research ..... p 22 Jul 12
Industrial spy - aristocrat of thieves ..... p 32 Jul 19

RESISTORS
Electronics color codes ..... p 37 Nov 15
How to apply pellet resistors ..... p 91 Feb 15
The negative resistance element (NRE): a new circuit component ..... p 21 May 31
Comments p 4 Jul 5, p 4 Jul 12..... p 4 Jul 19
New charts speed thin-film resistor design ..... p 72 Apr 12
Parasitics in integrated circuits: more trouble than meets the eye ..... p 32 Jul 5
Pilot plant mass produces thin films ..... p 64 Jun 7
Radial-lead film resistor automatically produced ..... p 54 Mar 1
Tunnel resistor - new device to speed up tunnel diodes ..... p 42 Jul 12

S

SALES See Business

SATELLITES
(See also Space Electronics)
After Echo II: what and why? ..... p 24 Sep 6
ComSat tackles problems - technical and fiscal.. p 18 Aug 9
DOD satellite net set for awards ..... p 26 Jun 7
First color facsimile transmitted by satellite..... p 51 May 24
German satellite station ..... p 74 Dec 6
If a satellite fails - go up and fix it ..... p 12 May 31
Latest satellite stabilizers let gravity do the work ..... p 16 Aug 23
Need weather data? Buy a satellite ground station ..... p 20 Jul 26
New look in this year's comsats ..... p 18 Jul 19
Radar designs acquiring new versatility ..... p 10 Sep 20
Slow sampling saves time ..... p 40 Nov 29
Space area code sorts commands for satellites ..... p 18 Jun 28
Syncom's time delay: no great problem ..... p 11 Nov 8
Test-ban monitors set for launch ..... p 57 Oct 18
Trick revives Telstar ..... p 30 Jan 11

SATURABLE REACTORS
New way to saturable reactors: stabilizing high-power rectifiers ..... p 62 May 24

SCANNERS
Computer analyzes x-rays ..... p 38 Nov 1
Conical scan array uses variable phase shifters .. p 30 Nov 29
High-speed servo positioner bonds mesa transistors ..... p 58 Feb 8
New antenna idea: scanning without phase shifters ..... p 27 Mar 29
Tv camera tracker - can it detect missile decoys? ..... p 51 Apr 26

SCATTER SYSTEMS
Orbital-scatter concept proves out ..... p 26 Nov 8
Skip radio replaces Alaskan cable ..... p 30 Jul 26

SCHMITT CIRCUITS
Fail-safe squelch circuit adapts to changing noise levels ... p 88 Jan 4
Improved Schmitt trigger uses SCR ... p 68 Apr 26
Schmitt trigger drives low impedance loads ... p 28 Aug 16

SEISMOGRAPHY
New transducers for communicating by seismic waves ... p 51 Apr 12
Comment ... p 4 May 24
Subaudio parametric amplifier for ocean-bottom seismometer ... p 28 Mar 1

SEMICONDUCTORS
(See also Diodes; Transistors)
Advances in microminiaturization ... p 45 Feb 15
Autos boost solid-state devices ... p 39 Oct 4
Bad medicine for semiconductors ... p 10 Nov 1
Basic rules for designing reliability into semiconductor circuits ... p 62 Apr 12
Can RFI control prevent weapons failures? ... p 43 Nov 8
Chelate lasers are coming on strong ... p 32 Apr 26
Chemicals affect oscillator output ... p 46 Dec 13
Designing digital equipment with semiconductor networks ... p 35 Jan 18
Developing true solid-state static alternators ... p 58 May 24
Experimental neuristor gives nerve-like pulse propagation ... p 25 Mar 1
Family tree of semiconductors ... p 45 Apr 26
French reveal new field-effect structure ... p 56 Jun 14
Future keyed to materials properties ... p 66 Sep 6
Gate turn-off - unique solid state switch ... p 60 Apr 26
Home appliances: market for solid state ... p 14 Sep 13
Homogeneous semiconductors - a new generation of devices ... p 65 Jun 21
Hot carrier diodes switch in picoseconds ... p 53 Jul 19
How to achieve majority and threshold logic with semiconductors ... p 23 Nov 29
IEEE Solid State Conference: Look at what optical semiconductors do now ... p 32 Jun 28
Inside-diameter saws slice semiconductors ... p 65 Sep 20
Materials for space-age electronics ... p 37 Oct 25
Microelectronics around the world ... p 37 Aug 2
Micropower circuits - new frontier in solid state ... p 47 Jul 19
More reliability with controlled avalanche rectifiers ... p 38 Mar 29
New 40-mm silicon crystals permit larger-capacity devices ... p 84 Feb 8
New look at negative-resistance devices ... p 35 Mar 8
Comment ... p 4 Apr 26
New Tecnetrons switch 15 amp ... p 75 Sep 6
Optical coupling: new approach to micro-circuit interconnections ... p 23 Nov 22
Solid-State Conference: solid progress in solid-state seen at Philadelphia ... p 12 Mar 1
Solid-state ion implants forge tailor-made junctions ... p 26 Apr 19
Surface effects of ionizing radiation ... p 34 Oct 4
Tecnetron family expands ... p 18 May 17
Today's semiconductors ... p 37 Dec 6
Trends in logic circuit design ... p 38 Dec 6
Highlights of small-signal circuit ... p 46 Dec 6
Power and control circuits ... p 51 Dec 6
WESCON: technical highlights ... p 49 Aug 9

SERVICING
If a satellite fails - go up and fix it ... p 12 May 31

SERVOMECHANISMS
Aiming a 3-ton telescope hanging from balloon ... p 47 Feb 8
Designing servo amplifiers for high efficiency ... p 62 Feb 8
Comment ... p 4 Apr 12
Fiber optics, servo built into tape handler ... p 66 Feb 22
High-speed servo positioner bonds mesa transistors ... p 58 Feb 8
Servo tracks pill in human body ... p 58 Mar 22
Solving the AGC dilemma - servo system uses attenuator ... p 60 Jul 19
Tv camera tracker - can it detect missile decoys? ... p 51 Apr 26
Versatile servo amplifier for 50, 60, or 400-cycle operation ... p 44 Jan 18

SIGNAL GENERATORS
Contest produces novel circuit designs ... p 96 Mar 15
Cyrstal-controlled multivibrator has better stability ... p 60 Apr 12
Comment ... p 4 May 17
Sweep measurements - making the tough ones easy ... p 52 Apr 19

SILICON CONTROLLED RECTIFIERS
Capacitance chargers for space employ controlled rectifiers ... p 32 Oct 11
Comment ... p 6 Nov 1
Consumer electronics Pt II: Home and auto controls ... p 52 May 10
Developing true solid-state static alternators ... p 58 May 24
Home appliances: market for solid state ... p 14 Sep 13
New deflection circuit uses SCR, saves power ... p 56 Aug 9
Power and control circuits ... p 51 Dec 6
Silicon rectifier controls power in either direction ... p 63 Dec 20
Soaking multiplies SCR peaks ... p 17 Sep 20

SIMULATORS
Phase-locked klystrons simulate doppler radar ... p 44 Apr 19
Radioactive source generates probabilities ... p 54 Sep 13
Realistic sonar trainer simulates ship's wakes ... p 84 Mar 15
Simulating tactical radar and sonar ... p 25 Dec 13
Task force trains ashore ... p 40 Nov 22

SINGLE-SIDEBAND RADIO
Better superhets for sideband reception ... p 39 May 10
Comment ... p 4 Jul 12
Low-cost circuit measures frequency translation ... p 51 Nov 8
Military radio swinging to ssb ... p 29 Apr 5
Simple transistor modulators improve side-band communications ... p 54 Mar 8

SOLAR CELLS
Solid-state ion implants forge tailor-made junctions ... p 26 Apr 19

SOLDERING
Dips and waves improve soldering ... p 48 Jul 5
Electronic Packaging Conference: Hot-air machine speeds soldering ... p 44 May 31
Iron or machine can solder printed cables ... p 74 Nov 15
Module production quality assured by thermal cycling and life testing ... p 92 Jul 19
Pulses control soldering quality ... p 57 Oct 11
Selecting the right soldering-iron and tip ... p 48 Aug 16
WESCON: Micro-packaging for micro-electronics ... p 88 Aug 9
What makes a solder joint good? ... p 50 Nov 29

SOLID STATE See Semiconductors; Micro-electronics; Lasers

SONAR
Doppler sonar plots ship's course ... p 14 Nov 22
Gains in ASW surveillance threaten subs' invulnerability ... p 10 Sep 6
Realistic sonar trainer simulates ship's wakes ... p 84 Mar 15
Simulating tactical radar and sonar ... p 25 Dec 13
Sonar navigates at 1 Mc ... p 18 Aug 23
Stand by for those Navy RDT&E contracts: $1 1/2 billion ... p 10 Sep 13

SPACE ELECTRONICS
Air Force successfully tests new space booster ... p 26 Jul 26
C-W amplitrons for space telemetry ... p 78 Apr 26
Communicating with future deep-space probes ... p 28 May 31
Crosstalk: Needles no more ... p 3 Jul 5
Developing radiation-proof space equipment ... p 70 Aug 9
"Far-out" space contracts ... p 18 Feb 22
First details on Mercury spacecraft command receiver ... p 32 Feb 1
For space, an electronics lab ... p 42 Sep 13
Getting the most out of aerospace telemetry ... p 23 Sep 27
Holmes: it wasn't frustration (interview with D. B. Holmes) ... p 22 Jun 21
IEEE: Space round trips push techniques ... p 40 Sep 27
ITU agrees on space allocations ... p 17 Nov 15
ITU allocations: final list ... p 14 Nov 22
If a satellite fails - go up and fix it ... p 12 May 31
Inside the orbiting geophysical observatory ... p 61 Feb 15
Is USSR ahead in space instruments? ... p 16 Jul 5
LEM electronics faces new challenges ... p 22 Jul 19
Long-range spectrometer seeks missile defense clues ... p 16 May 10
Mariner C shaping up for '64 ... p 16 Aug 30
Mariner hunts cosmic rays ... p 50 Sep 13
Materials for space-age electronics ... p 37 Oct 25
Mercury to carry new experiments and slow-scan Tv ... p 18 Mar 22
NASA unveils Apollo computer ... p 17 Sep 27
New chore for orbiting dipoles ... p 14 May 31
New twist in space tracking: the vehicle tracks the ground ... p 10 Nov 15
The optical heterodyne - key to advanced space signaling ... p 29 Jul 12
Optical radar for space rendezvous ... p 44 Oct 4
Orbiting observatory nears flight ... p 28 Apr 12
Polaris-proven electronics to guide Apollo ... p 14 Oct 4
Probes can take nuclear blasts ... p 78 Aug 9
Project Apollo's mission: get two Americans to the moon ... p 18 Feb 8
Saturn I booster launch will trigger biggest tracking test yet ... p 10 Dec 6
Sea drone snares capsules ... p 18 Aug 16
Slow sampling saves time ... p 40 Nov 29
Soviets planning transmission from Mars ... p 18 Jan 11
Space area code sorts commands for satellites ... p 18 Jun 28
Surface effects of ionizing radiation ... p 34 Oct 4
Symposium: What happens to dielectrics in space? ... p 68 Jul 19
Target date for moon base 1972? ... p 14 Sep 27
Telepathy maybe ... p 42 Oct 11
Test-ban monitors set for launch ... p 57 Oct 18
Using the latest semiconductor circuits in a UHF digital converter ... p 37 Aug 30
Waveguide telemeters space-chamber data ... p 74 Jun 28
West Ford dipole belt girdles earth ... p 12 Jul 5
Will lasers protect our cities against ICBM's? ... p 20 May 3

SPECTRUM ANALYZERS
Contest produces novel circuit designs ... p 96 Mar 15
Long-range spectrometer seeks missile defense clues ... p 16 May 10
RFI - causes, effects, cures ... p 37 Jun 21
Comment ... p 4 Aug 30

SQUELCH CIRCUITS
Fail-safe squelch circuit adapts to changing noise levels ... p 88 Jan 4

STEREO
Consumer electronics Pt I: Entertainment ... p 49 May 3

STORAGE See Memories

SUPERCONDUCTIVITY
Novel test techniques measure Q in cryogenic resonant circuits ... p 43 Feb 22

SWITCHING CIRCUITS
Chart gives RLC values for critical damping ... p 34 May 31
Circuit trends in nanosecond switching ... p 35 Sep 20
Contact arrangement simplifies design ... p 86 Feb 8
Comment ... p 4 Apr 19
Design of D-C switches with negative resistance elements ... p 32 Jul 12
Comments p 4 Jul 5, p 4 Jul 12, ... p 4 Jul 19
Developing true solid-state static alternators ... p 58 May 24
Gate turn-off - unique solid state switch ... p 60 Apr 26
High speed integrated circuits with load-compensated diode-transistor logic ... p 68 Mar 15
Hot carrier diodes switch in picoseconds ... p 53 Jul 19
A key to nanosecond switching combining tunnel and charge-storage diodes ... p 42 Oct 18
Mechanizing transistor switch design ... p 47 Oct 18
NEREM: Research in New England ... p 23 Nov 1
New antenna idea: scanning without phase shifters ... p 27 Mar 29
New Tecnetrons switch 15 amp ... p 75 Sep 6
The PIN diode: versatile microwave component ... p 40 Mar 8
Power and control circuits ... p 51 Dec 6
Sequence pulse generator saves transistors ... p 44 Aug 2
Silicon rectifier controls power in either direction ... p 63 Dec 20
Speech operates safety switch ... p 78 Jun 21
Taking human error out of nuclear experiments ... p 46 Jun 14
Tunnel diodes Pt IV: Logic and switching circuits ... p 26 Jul 5
WESCON: technical highlights ... p 49 Aug 9

T

TELEMETRY
Aiming a 3-ton telescope hanging from a balloon ... p 47 Feb 8
The arrowhead: compact new telemetry antenna ... p 66 Apr 26
C-W amplitrons for space telemetry ... p 78 Apr 26
Communicating with future deep-space probes ... p 28 May 31
Designing a simple telemeter for medical research ... p 47 Jan 25
Down Under - suddenly Mecca for radio men ... p 20 Jan 4
First details on Mercury spacecraft command receiver ... p 32 Feb 1
Getting the most out of aerospace telemetry ... p 23 Sep 27
IEEE: Space round trips push techniques ... p 40 Sep 27
ISA: Telemetry on muscle power ... p 14 Sep 20
Inductive telemetry improves spin-system measurements ... p 41 Nov 15
Inside the orbiting geophysical observatory ... p 61 Feb 15
Multitone oscillators - new source of simultaneous frequencies ... p 86 Jan 4
NASA's newest trackers go to Australia ... p 54 Nov 8
New aerospace transmitter packs 3-watts in fist-sized can ... p 52 Jan 18
New phase-tracking demodulator will not lock on sidebands ... p 52 Feb 8
New telemetry antenna adds flexibility ... p 48 Feb 1
Comment ... p 4 Feb 15
New twist in space tracking: the vehicle tracks the ground ... p 10 Nov 15
Predetection recording: Solution to the telemetry dilemma? ... p 30 Sep 13

Servo tracks pill in human body ..... p 58 Mar 22
System packaging uses book configuration ..... p 56 Apr 5
Telemetry today ..... p 31 Sep 6
Waveguide telemeters space-chamber data ..... p 74 Jun 28

TELEVISION
(See also Color Television)
CRT recording has wide bandwidth ..... p 60 Nov 15
Consumer electronics Pt I: Entertainment ..... p 49 May 3
Delta modulator codes television wageguide link ..... p 50 Aug 2
Far Tv - a flying relay ..... p 32 Aug 2
French Tv spurred by new stations ..... p 47 Sep 20
Here's that new color-Tv tube ..... p 26 Jun 28
Infrared Tv tube uses new principle ..... p 48 Sep 13
New tubes and circuits for consumer electronics ..... p 47 Jan 11
Platters play pictures on Tv set ..... p 7 Aug 30
Small-screen Tv ..... p 11 Dec 6
Tv camera tracker - can it detect missile decoys? ..... p 51 Apr 26
Tv dissolve wiper ..... p 40 Sep 6
Thermoplastic video tape ready soon ..... p 54 Jul 26
Tunnel diodes Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
TVIST: new look in photoelectric storage tubes ..... p 74 Jun 21
UHF transmitter operates by remote control ..... p 61 Aug 2

TEST EQUIPMENT
(See also Instruments; Oscilloscopes; Signal generators)
Arc-protection circuits ..... p 54 Feb 22
Building a simple transistor tester ..... p 56 Apr 19
Comment ..... p 4 Jun 28
Checking connector production ..... p 96 Feb 8
Dynamic null - new method for measuring equipment performance ..... p 78 Mar 15
Comment ..... p 4 May 3
Easy way to test accelerometers ..... p 82 Jul 19
Easy ways to make microwave phase measurements ..... p 50 Mar 8
Four-in-one system tests plastic structures ..... p 38 Aug 9
High-speed production checking of logic wiring ..... p 56 Mar 29
Infrared inspection promises to assure production reliability ..... p 62 Jun 14
Comment ..... p 4 Jun 28
Module production quality assured by thermal cycling and life testing ..... p 92 Jul 19
Phosphors trace heat flow patterns ..... p 40 Aug 23
Radio receiver detects faulty parts or joints ..... p 86 Oct 18
Simple counter tester uses cascaded one-shots ... p 40 Apr 5
Tester checks out thermocouple circuits ..... p102 Mar 15
Comment ..... p 4 May 3
Two-phase oscillator covers 0.1 to 1,000-cps ... p 27 Oct 4
Unique frequency comparator has sense of direction ..... p 36 Mar 1
Universal test set urged ..... p 11 Sep 27
Universal waveform analyzer aids automatic testing ..... p 56 Apr 12

THERMISTORS
ISA: Telemetry on muscle power ..... p 14 Sep 20

THERMOCOUPLES
Tester checks out thermocouple circuits ..... p102 Mar 15
Comment ..... p 4 May 3

THERMOELECTRICS
Consumer electronics Pt III: Appliances and housewares ..... p 46 May 17
Comment ..... p 4 Aug 16
New cooler uses thermomagnetic effect ..... p 84 Sep 6
No-chop IR detector cuts size ..... p 28 May 24

THIN FILMS
Advances in microminiaturization ..... p 45 Feb 15
British Show: Microcircuits are busting out in Britain ..... p 60 Jun 7
ECCANE: Active thin-film device problems fluxe ..... p 41 Oct 11
FJCC: What's new in computer memories ..... p 35 Nov 8
Family tree of semiconductors ..... p 45 Apr 26
Flip chips easier to connect ..... p 82 Oct 18
Foils get thinner, more versatile ..... p 60 Jul 26
Graphite masks cut thin-film expense ..... p 61 Nov 8
IEEE Solid State Conference: New laser structure drives output past 1 w ..... p 24 Jun 21
Inductors no problem: new thin-film amplifier ... p 46 Jun 7
Microelectronics around the world ..... p 37 Aug 2
Micropower circuits - new frontier in solid state ..... p 47 Jul 19
Modules incorporate integrated circuits ..... p 78 May 24
New charts speed thin-film resistor design ..... p 72 Apr 12
Parasitics in integrated circuits: more trouble than meets the eye ..... p 32 Jul 5
Pilot plant mass produces thin films ..... p 64 Jun 7
Solution process sprays thin films on substrates ..... p 24 Jul 26
Thin-film memory might cost 0.3 cent per bit ... p 44 Nov 22
Thin-film photocells get brighter faster ..... p 99 Sep 6
Thin-film production performed continuously .... p 70 Apr 19
Thin films: automatic deposition control ..... p 33 Mar 29
Thin magnetic films create logic circuits ..... p 62 Feb 22
Transfer process avoids P-C open circuits ..... p 68 Jan 18
Vacuum deposited circuits use field effect ..... p 80 Apr 12
Vacuum Symposium: Modulated beams build microcircuits ..... p 26 Oct 25

THYRATRONS
New thyratron peaks at 200 Mw ..... p 94 Apr 12

TIMERS
Electromechanical timer for lab applications .... p 78 Feb 15
Simple counter tester uses cascaded one-shots ... p 40 Apr 5
Taking human error out of nuclear experiments ..... p 46 Jun 14
Unique synchronizing technique increases digital transmission rates ..... p 75 Mar 15
VHF counter measures time intervals precisely... p 27 Aug 23

TRACKING
Air-sea-sub display plots naval targets ..... p 20 Jun 7
Computer runs missile tracker ..... p 12 Jun 14
Conical scan array uses variable phase shifters .. p 30 Nov 29
Injection laser systems for communications tracking ..... p 35 Dec 13
Laser pulses track targets ..... p 64 Oct 18
Long-range spectrometer seeks missile defense clues ..... p 16 May 10
NASA's newest trackers go to Australia ..... p 54 Nov 8
New infrared system tracks missiles against bright Florida sky ..... p 39 Apr 19
New twist in space tracking: the vehicle tracks the ground ..... p 10 Nov 15
Tv camera tracker - can it detect missile decoys? ..... p 51 Apr 26

TRANSCEIVERS
Latest field-mapping improvement - lead-less transceiver probe works underwater ..... p 56 Jul 19

TRANSDUCERS
Easy way to test accelerometers ..... p 82 Jul 19
ISA: Telemetry on muscle power ..... p 14 Sep 20
Inductive telemetry improves spin-system measurements ..... p 41 Nov 15
Magnetic strip keeps tape running true ..... p 42 Jan 11
Multi-frequency transducers improve ultrasonic cleaning ..... p 54 Nov 22
New transducers at biomedical meeting ..... p 60 May 10
New transducers for communicating by seismic waves ..... p 51 Apr 12
Comment ..... p 4 May 24
No-chop IR detector cuts size ..... p 28 May 24
Now you can use nonreciprocal devices at low frequencies ..... p 56 Feb 2
Probes can take nuclear blasts ..... p 78 Aug 9
Ultrasonics state-of-the-art report ..... p 33 Oct 18

TRANSDUCTORS See Saturable Reactors

TRANSFORMERS
Are tunable transmitters on the way out? ..... p 30 Jun 21
Electronics color codes ..... p 37 Nov 15
Frequency septupler provides staple 420-cps voltage ..... p 58 May 3

TRANSISTOR CIRCUITS
(See also Amplifiers; Bridge Circuits; Computers; Control Circuits; Converters; Counters; D-C Amplifiers; Digital Techniques; Logic Circuits; Modulators; Oscillators; Protective Circuits; Pulse Techniques; Receivers; Schmitt Circuits; Switching Circuits; Transmitters)
Aiming a 3-ton telescope hanging from a balloon ..... p 47 Feb 8
Basic rules for designing reliability into semiconductor circuits ..... p 62 Apr 12
Designing input circuits with lowest possible noise ..... p 46 Aug 2
Designing servo amplifiers for high efficiency ..... p 62 Feb 8
Comment ..... p 4 Apr 12
Gate turn-off - unique solid state switch ..... p 60 Apr 26
New deflection circuit uses SCR, saves power .. p 56 Aug 9
New look at negative-resistance devices ..... p 35 Mar 8
Comment ..... p 4 Apr 26
Novel coincidence technique for transistor decade counter ..... p 71 Feb 15
Reducing winter skids with a transistor warning circuit ..... p 56 Jan 25
Solving the AGC dilemma - servo system uses attenuator ..... p 60 Jul 19
Tunnel diode detects currents down to 100 femtoamperes ..... p 33 Apr 5
Comment ..... p 4 Apr 26
Unity-gain buffer acquires precision by feedback ..... p 36 Dec 20
Using the latest semiconductor circuits in a UHF digital converter ..... p 37 Aug 30

TRANSISTORS
(See also Field Effect Transistors)
Advances in microminiaturization ..... p 45 Feb 15
Avalanche transistors test 10-nsec logic ..... p 46 Jul 12
Comment ..... p 4 Aug 30
Avalanching transistor generates microwaves .... p 35 Oct 25
Building a simple transistor tester ..... p 56 Apr 19
Comment ..... p 4 Jun 28
Crosstalk: Defeat in Venice ..... p 3 Jul 12
Family tree of semiconductors ..... p 45 Apr 26
Fresh approach to measuring tansistor beta ..... p 47 Jul 26
Here's that new color-Tv tube ..... p 26 Jun 28
High-speed servo positioner bands mesa transistors ..... p 58 Feb 8
How to choose transistors for low noise ..... p 50 Jan 11
How to get maximum input impedance with field-effect transistors ..... p 44 Mar 8
IEEE: Device powers go higher ..... p 57 Nov 15
IEEE Solid State Conference: Look at what optical semiconductors do now ..... p 32 Jun 28
Logic principles for multi-emitter transistors .... p 25 Sep 13
Low-noise preamplifier uses field-effect transistors ..... p 67 Apr 12
Comment ..... p 4 Jun 21
Mechanizing transistor switch design ..... p 47 Oct 18
New device simplifies power supply design .... p 39 May 17
New look at negative-resistance devices ..... p 35 Mar 8
Comment ..... p 4 Apr 26
New package for microtransistor ..... p 75 Nov 8
Optical coupling: key to design freedom ..... p 82 Mar 22
Parasitics in integrated circuits: more trouble than meets the eye ..... p 32 Jul 5
Power-transistor circuits - getting both reliability and economy ..... p 54 May 24
Practical way to measure transistor thermal resistance ..... p 66 Feb 15
Comment ..... p 4 Jun 14
Put more snap in logic circuits with field-effect transistors ..... p 43 Jun 14
Quick way to find beta (h-FE), alpha (h-FB), and (h-FC) ..... p 64 Aug 9
Surface effects of ionizing radiation ..... p 34 Oct 4
Te-netron family expands ..... p 18 May 17
Today's semiconductors
Highlights of small-signal circuit design ..... p 46 Dec 6
Power and control circuits ..... p 51 Dec 6
Two collectors better than one ..... p 30 May 17
Unijunction transistor simplifies voltage-frequency converter ..... p 56 Oct 25

TRANSMISSION LINES
Speeding digital data over phone lines ..... p 30 Sep 27

TRANSMITTERS
Are tunable transmitters on the way out? ..... p 30 Jun 21
Army may buy radios for every front-line soldier. p 10 Nov 1
Bugs and antibugs: new designs for hidden ears .. p 10 Oct 25
C-W amplitrons for space telemetry ..... p 78 Apr 26
Easy-to-use chart for VSWR ..... p 38 Nov 22
Multicoupler puts five transmitters on one antenna ..... p 33 Dec 13
New aerospace transmitter packs 3-watts in fist-sized can ..... p 52 Jan 18
RFI - causes, effects, cures ..... p 37 Jun 21
Comment ..... p 4 Aug 30
Servo tracks pill in human body ..... p 58 Mar 22
Ssb system goal is 20-year life ..... p 75 Oct 25
UHF transmitter operates by remote control ..... p 61 Aug 2
Versatile R-F monitor shows power and VSWR ... p 44 Mar 29
Wireless mikes get F-M band ..... p 26 Jun 28

TRANSPONDERS
Communicating with future deep-space probes... p 28 May 31
F-m feedback stabilizes airborne solid-state VHF transponders ..... p 66 Dec 6
Undersea transmitters to locate missile impacts ..... p 18 Feb 15

TRAVELING-WAVE TUBES
Subnanosecond radar shows high resolution ..... p 36 May 31
TWT uses new focusing concept ..... p 80 Jun 28
Ultrasonics state-of-the-art report ..... p 33 Oct 18
The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
Will British TWT's make further inroads? ..... p 50 Jul 12

TROPOSPHERIC SCATTER
Recent tests show tropo scatter better than believed ..... p 42 Mar 1

TUBE CIRCUITS
Arc-protection circuits ..... p 54 Feb 22
Circuit with a twist: the cascade follower ..... p 69 Dec 6
Hybrid voltmeter avoids aging errors ..... p 41 Sep 20
New tubes and circuits for consumer electronics ..... p 47 Jan 11
R-F oscillator has improved stability ..... p 62 Aug 9

TUBES
Are hot cathodes on the way out? ..... p 39 Jun 7
Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12

C-W amplitrons for space telemetry ..... p 78 Apr 26
Electronics color codes ..... p 37 Nov 15
Generator for one-millimeter waves – Tornadotron ..... p 21 Aug 16
IEEE: Device powers go higher ..... p 57 Nov 15
Infrared Tv tube uses new principle ..... p 48 Sep 13
Microwave tubes get cheaper, less noisy ..... p 52 Dec 13
New tubes and circuits for consumer electronics ..... p 47 Jan 11
Novel bwo doesn't use magnet ..... p 47 Sep 27
Selecting tubes for wide bandwidth ..... p 53 Oct 25
Welding improves grid construction ..... p 62 Sep 20
Will tunnel cathode bring new tubes? ..... p 86 Feb 15
Window materials for high-power microwave tubes ..... p 40 May 31

TUNERS
Are tunable transmitters on the way out? ..... p 30 Jun 21
New technique protects receivers from high power ..... p 32 Mar 1
Resonant-cavity tuning now made easy ..... p 46 Jan 18
Tunnel diodes Pt I: Using them as sinusoidal generators ..... p 36 Jun 14

TUNNEL DIODES
Backward-diode clamp reduces tunnel-diode delays ..... p 56 Feb 8
Circuit trends in nanosecond switching ..... p 35 Sep 20
Continuous readout of magnetic cores ..... p 38 Sep 6
Delta modulator codes television waveguide link ..... p 50 Aug 2
How to make tunnel diodes even more useful .... p 52 Jun 7
A key to nanosecond switching combining tunnel and charge-storage diodes ..... p 42 Oct 18
Latest field-mapping improvement – lead-less transceiver probe works underwater ..... p 56 Jul 19
New look at negative-resistance devices ..... p 35 Mar 8
Comment ..... p 4 Apr 26
One-stage scaler needs no complex feedback ... p 32 Sep 27
Operating X-band tunnel diodes at Q-band .... p 32 Dec 27
Saving microcircuit power with tunnel-diode coupling ..... p 30 Aug 23
Supplying low-impedance power for tunnel diodes ..... p 60 Jan 18
Trends in logic circuit design ..... p 38 Dec 6
Tunnel diode detects currents down to 100 femtoamperes ..... p 33 Apr 5
Comment ..... p 4 Apr 26
Tunnel diodes
Pt I: Using them as sinusoidal generators ..... p 36 Jun 14
Pt II: Amplifiers working beyond transistor capabilities ..... p 68 Jun 21
Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
Pt IV: Logic and switching circuits ..... p 26 Jul 5
Tunnel diodes boost TRL speed ..... p 50 May 10
Tunnel resistor – new device to speed up tunnel diodes ..... p 42 Jul 12
Using the latest semiconductor circuits in a UHF digital converter ..... p 37 Aug 30

TWISTORS
INTERMAG: Packing a half-million bits in a cubic inch ..... p 58 Apr 19
Semipermanent memory: latest use for twistors ..... p 80 Mar 15

U

ULTRASONICS
Consumer electronics Pt III: Appliances and housewares ..... p 46 May 17
Future keyed to materials properties ..... p 66 Sep 6
Magnetic field rotates ultrasonic waves ..... p 64 Jan 25
Multi-frequency transducers improve ultrasonic cleaning ..... p 54 Nov 22
Ultrasonic rotary drive may open up many new applications for micro devices ..... p 56 Jan 11
Ultrasonic waves clean circuit boards ..... p 86 May 24
Ultrasonics state-of-the-art report ..... p 33 Oct 18

UNDERWATER ELECTRONICS (See also Sonar)
Air-sea-sub display plots naval targets ..... p 20 Jun 7
Floating drill gets on-the-spot help ..... p 17 Sep 27
Gains in ASW surveillance threaten subs' invulnerability ..... p 10 Sep 6
How Navy flies ASW boats ..... p 14 Jul 5
Hydrophones will track subs ..... p 19 Feb 15
Latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
Navy's new ship program calls for more electronics ..... p 10 Oct 4
New techniques pay off for Polaris fire-control system ..... p 61 Oct 25
New underwater gamma spectrometer ..... p 56 Mar 8
Next frontier the oceans? ..... p 56 Nov 8
Optical device to contract dolphins ..... p 46 Nov 22
Realistic sonar-trainer simulates ship's wakes.... p 84 Mar 15
Robot copters join Navy's anti-sub arsenal ..... p 18 Apr 19
Subaudio parametric amplifier for ocean-bottom seismometer ..... p 28 Mar 1
Task force trains ashore ..... p 40 Nov 22
Undersea transmitters to locate missile impacts .. p 18 Feb 15

V

VACUUM DEPOSITION
Inductors no problem: new thin-film amplifier ... p 46 Jun 7
Pilot plant mass produces thin films ..... p 64 Jun 7
Thin-film production performed continuously .... p 70 Apr 19
Vacuum deposited circuits use field effect ..... p 80 Apr 12
Vacuum Symposium: Modulated beams build microcircuits ..... p 26 Oct 25

VARACTORS
F-m feedback stabilizes airborne solid-state VHF transponder ..... p 66 Dec 6
Highlights of small-signal circuit design ..... p 46 Dec 6
How to design solid-state microwave generators ..... p 23 Oct 11
New aerospace transmitter packs 3-watts in fist-sized can ..... p 52 Jan 18
S-band paramp approaches noise-figure minimum ..... p 57 Jun 28
Using varactors to extend frequency-control .... p 48 Nov 8
Varactor cutoff 800 Gc ..... p 31 Jun 7

W

WAVEGUIDES
Delta modulator codes television waveguide link ..... p 50 Aug 2
New millimeter components and techniques ..... p 33 Jan 11
Waveguide telemeters space-chamber data ..... p 74 Jun 28

WEATHER FORECASTING See Meteorology

WELDING
Construction of electron-beam space welder begins ..... p 30 Jul 19
Electron Beam Symposium: Microwelding – laser or electron beam? ..... p 23 Jul 5
Electron beam welding solves relay sealing problems ..... p 90 Jun 28
Electronic Packaging Conference: Hot-air machine speeds soldering ..... p 44 May 31
High power at millimeters – plasma harmonics the key ..... p 16 Aug 30
Laser welds copper leads ..... p 88 Oct 25
Self-setting parallel-gap welder for micro-circuits ..... p 91 Dec 6
Welding improves grid construction ..... p 62 Sep 20
Welding joins aluminum to other metals easily... p 56 Nov 22
WESCON: Micro-packaging for micro-electronics ..... p 88 Aug 9
Will lasers weld circuit components? ..... p 54 Jul 12

WIRE
Electronics color codes ..... p 37 Nov 15
Machine simplifies banding process ..... p 60 Feb 1
Serrations solve wire-termination problem ..... p 86 Jan 25
Which permanent electrical connection should you use? ..... p 50 Jan 25

Z

ZENER DIODES
High precision d-c level shifter reduces output impedance ..... p 65 May 3
New device simplifies power supply design ..... p 39 May 17

AUTHORS' INDEX

A

Addeo, E., Air Force successfully tests new space booster ..... p 26 Jul 26
Lasers fill medical needs ..... p 30 Apr 19
Addeo, E & others, High power at millimeters – plasma harmonics the key ..... p 16 Aug 30
Algar, L. E. & others, New thyratron peaks at 200 Mw ..... p 94 Apr 12
Allen, G. F., Reliability slide rule ..... p 44 Sep 6
Anderson, W. W., latest antisubmarine aid: magnetic contour display system ..... p 58 Aug 9
Anello, B. & L. H. Dulberger, Electronics markets 1963 ..... p 43 Jan 4
Arnold, J. A., High-speed production checking of logic wiring ..... p 56 Mar 29
Auer, J., Cordwood package gets new tubular ceramic capacitors ..... p 43 Aug 16

B

Babits, V.A., Infrared Tv tube uses new principle ..... p 48 Sep 13
Baker, R. M., Measuring laser output with rat's nest calorimeter ..... p 36 Feb 1
Balamuth, L., Ultrasonic rotary drive may open up many new applications for micro devices ..... p 56 Jan 11
Balder, J. C. & C. Kramer, Delta modulator codes television waveguide link.... p 50 Aug 2
Barditch, I. F. & C. Z. Leinkram, Wetting agent solves photoetching problems ..... p 54 Dec 13
Barlow, D., British develop new VLF naveid.... p 36 Aug 16
Microcircuits are busting out in Britain ..... p 60 Jun 7
Multicomputers to rule English sky ..... p 14 Oct 11
New from Britain: tunable detectors, faster microwave switching ..... p 22 Feb 1
Will British TWT's make further inroads?..... p 50 Jul 12
Barlow, D. & others, Microelectronics around the world ..... p 37 Aug 2
Barry, G. H. & J. D. Hawkins, Multicoupler puts five transmitters on one antenna ..... p 33 Dec 13
Baumann, H., Inductive telemetry improves spin-system measurements..... p 41 Nov 15
Practical way to measure transistor thermal resistance ..... p 66 Feb 15
Comment ..... p 4 Jun 14
Benjaminson, A., Phase-locked klystrons simulate doppler radar ..... p 44 Apr 19
Bergman, R. H. & M Cooperman, Tunnel resistor – new device to speed up tunnel diodes..... p 42 Jul 12
Biddlecomb, R. W., Latest multivibrator improvement – linear voltage-to-frequency converter ..... p 64 Apr 26
Bidwell, A. C., Layout machine scribes on glass ..... p 52 Oct 4
Bignell, T. R., How to get maximum input impedance with field-effect transistors ..... p 44 Mar 8
Blair, W. L. & J. C. Wright, F-m feedback stabilizes airborne solid-state VHF tran-sponder ..... p 66 Dec 6
Bockamuehl, R.R., Simple circuits measure FET parameters ..... p 34 Aug 23
Bodnar, M., Versatile servo amplifier for 50, 60 or 400-cycle operation ..... p 44 Jan 18
Bohley, P. & others, Measuring missile antenna impedance in flight ..... p 36 Jul 12
Bok, J., Homogeneous semiconductors – a new generation of devices ..... p 65 Jun 21
Bondley, R. J., Window materials for high-power microwave tubes ..... p 40 May 31
Bonwitt, W. F. & T. Shahnazarian, Checking connector production ..... p 96 Feb 8
Boyer, J. M., Hula-hoop antennas: a coming trend? ..... p 44 Jan 11
Briskman, B. A., Are tunable transmitters on the way out? ..... p 30 Jun 21
Military communication systems get simpler, smaller, faster ..... p 14 Jun 14
Military radio swinging to sb ..... p 29 Apr 6
Telemetry today ..... p 31 Sep 6

Broom, R. F. & C. Hilsum, Diode lamp makes tape readers faster ..... p 44 May 17
Brown, H. J. & other, Racing the solar eclipse ..... p 37 Jul 26
Brown, M. N. & C. F. Visser, Serrations solve wire-termination problem ..... p 86 Jan 25
Brown, W. G. & others, C-W amplitrons for space telemetry ..... p 78 Apr 26
Bruene, W. & others, Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12
Brunetto, F., Gate turn-off - unique solid state switch ..... p 60 Apr 26
Bud, P. J., Ultrasonic waves clean circuit boards ..... p 86 May 24
Budde, C. A., One-stage scaler needs no complex feedback ..... p 32 Sep 27
Burfeindt, K. L., Overload protection without high power dissipation ..... p 36 Mar 29
Burns, G. & M. I. Nathan, Injection lasers.... p 61 Dec 6

C

Caforella, T. & others, Cut-out slide rule simplifies noise calculations ..... p 64 Feb 8
Caldecott, R. & others, Measuring missile antenna impedance in flight ..... p 35 Jul 12
Campaigne, R. N. & D. A. Estabrooks, Machine coats films automatically ..... p 86 Apr 26
Cannan, W.W. & W.G. Carlson, The high fences at White Sands ..... p 64 Oct 18
Carlson, W. G. & W.W. Cannan, The high fences at White Sands ..... p 64 Oct 18
Carr, E.Q., Flip chips easier to connect ..... p 82 Oct 18
Carroll, J. M., Computer analyzes x-rays..... p 38 Nov 1
Task force trains ashore ..... p 40 Nov 22
Today's semiconductors ..... p 37 Dec 6
Carruth, R. & V. Sussman, Epoxy pellets improve diode production ..... p 64 Jul 26
Carter, E. A., Trade Expansion Act: help or hazard? ..... p 28 Mar 8
Casson, W. H. & C. C. Hall, New phase-tracking demodulator will not lock on sidebands ..... p 52 Feb 8
Charbonnier, R., Avalanche transistors test 10-nsec logic ..... p 46 Jul 12
Comment ..... p 4 Aug 30
Chow, P. & J. Cubert, A key to nanosecond switching combining tunnel and charge-storage diodes ..... p 42 Oct 18
Cichocki, C. & J. Dillon, Etched molds form p-c boards ..... p108 Sep 6
Ciehaski, R.R. & J.F. Lally, Coaxial filters - a practical design technique ..... p 35 Aug 30
Clampitt, L. L. & others, C-W amplitrons for space telemetry ..... p 78 Apr 26
Clark, L. E. & others, Highlights of small-signal circuit design ..... p 46 Dec 6
Coffey, C.S., VHF counter measures time intervals precisely ..... p 27 Aug 23
Cohen, C., For Tv - a flying relay ..... p 32 Aug 2
Japanese exports keep climbing ..... p 45 May 3
Presenting radar targets in color ..... p 54 Oct 18
Cohen, C. & others, Microelectronics around the world ..... p 37 Aug 2
Colbert, D. C. & M. C. Herzig, Voltage monitor needs only two saturable cores ..... p 50 Jun 7
Collis, R. T. H., Special computer integrates rainfall ..... p 70 May 24
Colman, R., Light beam controls potentiometers..... p 76 Jun 28
Compagna, E. & A. Overstrom, Welding improves grid construction ..... p 62 Sep 20
Cook, A. D. & R. E. Daniels, Advanced Clapp oscillator features 3-to-1 dynamic range ..... p 60 Feb 22
Cook, H. L., New charts speed thin-film resistor design ..... p 72 Apr 12
Cooper, T. & G. McFarland, Designing digital equipment with semiconductor networks ..... p 35 Jan 18
Cooperman, M. & R. H. Bergman, Tunnel resistor - new device to speed up tunnel diodes ..... p 42 Jul 12
Crafts, H. S., Components that learn and how to use them ..... p 49 Mar 22
Crawford, H. D. & A. B. Hale, F-m discriminator without tuned circuits ..... p 36 Nov 29
Csanky, G. & R. M. Warner Jr., Put more snap in logic circuits with field-effect transistors ..... p 43 Jun 14
Cubert, J. & P. Chow, A key to nanosecond switching combining tunnel and charge-storage diodes ..... p 42 Oct 18
Cuccia, C. L., S-band paramp approaches noise-figure minimum ..... p 57 Jun 28

D

Dahl, W. E., Communicating with future deep space probes ..... p 28 May 31
Daniels, R. E. & A. D. Cook, Advanced Clapp oscillator features 3-to-1 dynamic range ..... p 60 Feb 22
Davis, P. D. Jr. & G. D. Ezell, Subaudio parametric amplifier for ocean-bottom seismometer ..... p 28 Mar 1
Dean, C. E. & others, Cut-out slide rule simplifies noise calculations ..... p 64 Feb 8
Dees, J. W. & A. P. Sheppard, New millimeter components and techniques ..... p 33 Jan 11
Dersch, W.C., Speech operates safety switch... p 78 Jun 21
Dicken, H. K., Parasitics in integrated circuits: more trouble than meets the eye ..... p 32 Jul 5
Dillon, J. & C. Cichocki, Etched molds form p-c boards ..... p108 Sep 6
Dipaolo, S. J., Unique computer system monitors aircraft engines ..... p 38 Jan 11
Dixon, T. P., New infrared system tracks missiles against bright Florida sky ..... p 39 Apr 19
Dressel, H. & G.E. Weibel, Generator for one-millimeter waves ..... p 21 Aug 16
Drew, L. C., Using microcircuits in high-resolution range counters ..... p 31 Nov 22
Dulberger, L. H., Army demands new electronics techniques ..... p 20 Jul 12
Can synthetic sleep save time? ..... p 20 May 24
Gains in ASW surveillance threaten subs' invulnerability ..... p 10 Sep 6
How Navy flies ASW boats ..... p 14 Jul 5
Limited-war needs spur VTOL development ... p 30 Feb 15
Side-looking radar makes maps in flight ..... p 22 Mar 22
Will lasers protect our cities against ICBM's? . p 20 May 3
Dulberger, L. H. & B. Anello, Electronics markets 1963 ..... p 43 Jan 4
Dunlap, K. W. & D. L. Williams, Will lasers weld circuit components?..... p 54 Jul 12
Durio, J., Why a ring counter - why not a binary? ..... p 44 Jan 25
Dyson, L. M., Selecting tubes for wide bandwidth ..... p 53 Oct 25

E

Earle, W. E., Designing zero-drift d-c differential amplifiers ..... p 66 Nov 8
Elders, D. S. & R. A. Gerhold, Modules incorporate integrated circuits ..... p 78 May 24
Ellern, F., Capacitance chargers for space employ controlled rectifiers ..... p 32 Oct 11
Comment ..... p 6 Nov 1
Elliott, R., First details on Mercury spacecraft command receiver ..... p 32 Feb 1
Engelmann, R., Bi-quinary scaling: accuracy and simplicity at 500 Mc ..... p 34 Nov 15
Erikson, A., French control systems sophisticated, as usual ..... p 14 Nov 29
French find 7 lucky number ..... p 28 Aug 2
New Tecnetrons switch 15 amp ..... p 75 Sep 6
Tecnetron family expands ..... p 18 May 17
What's new in lasers? ..... p 14 Mar 1
Erikson, A. & others, Microelectronics around the world ..... p 37 Aug 2
Estabrooks, D. A. & R. N. Campaigne, Machine coats films automatically ..... p 86 Apr 26
Evans, T. & R. Pecina, Taking human error out of nuclear experiements ..... p 46 Jun 14
Ezell, G. D. & P. D. Davis Jr., Subaudio parametric amplifier for ocean-bottom seismometer ..... p 28 Mar 1

F

Fairley, D.O., How to design solid-state microwave generators ..... p 23 Oct 11
Faran, J.J. Jr., Hybrid voltmeter avoids aging errors ..... p 41 Sep 20
Farrah, H. R. & P. E. Sherr, New approach to weather data: every plane a station ..... p 38 Jul 12
Feist, W. M. & G. Wade, Are hot cathodes on the way out? ..... p 39 Jun 7
Feldman, C. & others, Vacuum deposited circuits use field effect ..... p 80 Apr 12
Firestone, J. H., Gated pulses yield selected frequency outputs ..... p 38 Dec 20
Fleenor, E. G. Low-noise preamplifier uses field-effect transistors ..... p 67 Apr 12
Comment ..... p 4 Jun 21
Fleischer, A. A. & E. Johnson, New digital conversion method provides nanosecond resolution ..... p 55 May 3
Flynn, G. J., Black box blast detection - hope or hoax? ..... p 26 Jan 4
Data communications boom gathers steam ..... p 26 May 10
Frankland, H. G. & M. Freitag, Fabrication aids cut submodule rejection rate ..... p 68 May 17
Freitag, M. & H. G. Frankland, Fabrication aids cut submodule rejection rate ..... p 68 May 17
Frings, H. and M., Sound: a better way to control pests ..... p 24 Jan 11
Fujita, H. & others, New modulation technique simplifies circuits ..... p 52 Jan 25

G

Gaertner, W. W. & M Schuller, Micropower circuits - new frontier in solid state ..... p 47 Jul 19
Galenian, J. C., Designing radar receivers to overcome jamming ..... p 50 May 17
Gaon, J., Simple counter tester uses cascaded one-shots ..... p 40 Apr 5
Gausman, T. E., Standardizing noise-figure measurement ..... p124 Jan 4
Gerhold, R. A. & D. S. Elders, Modules incorporate integrated circuits ..... p 78 May 24
Geyger, W. A., Frequency septupler provides stable 420-cps voltage ..... p 58 May 3
Gilleo, M. A. & J. T. Last, Optical coupling: new approach to microcircuit inter-connections ..... p 23 Nov 22
Giorgis, J. & E. Gottlieb, Tunnel diodes
Pt I: Using them as sinusoidal generators ..... p 36 Jun 14
Pt II: Amplifiers working beyond transistor capabilities ..... p 68 Jun 21
Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
Pt IV: Logic and switching circuits ..... p 26 Jul 5
Glaser, P. F. & E. R. Spangler, Inside the orbiting geophysical observatory ..... p 61 Feb 15
Goldmark, P. C., How hi is fi? (interview).... p 33 Jun 14
Comment ..... p 4 Aug 2
Gooch, B. R., Magnetic strip keeps tape running true ..... p 42 Jan 11
Goodykoontz, J. R., System packaging uses book configuration ..... p 56 Apr 5
Gore, T. V. & W. V. Lane, Module production quality assured by thermal cycling and life testing ..... p 92 Jul 19
Gottlieb, E. & J. Giorgis, Tunnel diodes
Pt I: Using them as sinusoidal generators ..... p 36 Jun 14
Pt II: Amplifiers working beyond transistor capabilities ..... p 68 Jun 21
Pt III: Mixer and converter circuits ..... p 60 Jun 28
Comment ..... p 4 Aug 2
Pt IV: Logic and switching circuits ..... p 26 Jul 5
Grabowski, S. J., Pulse power supply design for laser pumping ..... p 33 Dec 20
Grant, C. R. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5
Gray, S. B., Consumer electronics
Pt I: Entertainment ..... p 49 May 3
Comment ..... p 4 Jul 19
Pt II: Home and auto controls ..... p 52 May 10
Pt III: Appliances and housewares ..... p 46 May 17
Comment ..... p 4 Jul 19
Three new computer systems announced ..... p 10 Dec 13
Greenburg, R., Getting both reliability and economy in power-transistor circuits ..... p 54 May 24
Grindle, B. & H. Schmid, Pulse-width modulator offers precision performance ..... p 29 Oct 11
Gruenberg, J., Safer power plants: why not?... p 38 May 24
Gutierrez, W. A. & others, Vacuum deposited circuits use field effect ..... p 80 Apr 12
Gutzwiller, F. W., More reliability with controlled avalanche rectifiers ..... p 38 Mar 29

H

Hagn, G. & B. Siffard, Easy-to-use chart for VSWR ..... p 38 Nov 22
Haill, H.K. & L. Jasper, Improving a-d converter accuracy ..... p 38 Sep 13
Hale, A. B. & H. D. Crawford, F-m discriminator without tuned circuits ..... p 36 Nov 29
Hall, C. C. & W. H. Casson, New phase-tracking demodulator will not lock on sidebands ..... p 52 Feb 8
Hall, K. L., Basic rules for designing reliability into semiconductor circuits ..... p 62 Apr 12

Hamilton, D. J. & L. L. Williams, How to make tunnel diodes even more useful ..... p 52 Jun 7
Hamilton, J. J., Low-noise c-w klystron oscillators meet doppler radar requirements.... p 85 Dec 6
Harris, E. L. Jr., Solid-state components shrink photoflash control ..... p 70 Apr 12
Hartley-Smith, A. & F. W. Kime, Data display system works in microseconds ..... p 26 Nov 29
Hartman, C. W., How to apply pellet resistors ..... p 91 Feb 15
Hartwig, W. H., Novel test techniques measure Q in cryogenic resonant circuits..... p 43 Feb 22
Hauptschein, A. & R.C. Sommer, Getting the most out of aerospace telemetry ..... p 23 Sep 27
Hawkins, J. D. & G. H. Barry, Multicoupler puts five transmitters on one antenna ..... p 33 Dec 13
Haynes, J. L., Dynamic null - new method for measuring equipment performance ..... p 78 Mar 15
Comment ..... p 4 May 3
Heckman, E. H., Three new approaches to pulse modulation ..... p 62 May 3
Hejhall, R. C. & others, Highlights of small-signal circuit design ..... p 46 Dec 6
Heller, P., Honeycomb enhances cardwood packaging ..... p 94 Feb 15
Heller, R. E., The PIN diode: versatile microwave component ..... p 40 Mar 8
Herndon, M. & A. C. Macpherson, Rapid method measures diode characteristics ..... p 50 Jun 14
Herzig, M. C. & D. C. Colbert, Voltage monitor needs only two saturable cores ..... p 50 Jun 7
Hessinger, P.S., How good are beryllia ceramics? ..... p 75 Oct 18
Hilsum, C. & R. F. Broom, Diode lamp makes tape readers faster ..... p 44 May 17
Holonyak, N. Jr., First color photos show active region in visible-light diode laser..... p 35 Mar 1
Hood, H. C., Bugs and antibugs: new designs for hidden ears ..... p 10 Oct 25
Can 1-f communications beat nuclear black-out? ..... p 11 Nov 1
Computers pace progress in medical humanetics ..... p 10 Oct 11
From flash guns to lasers ..... p 16 Aug 16
Integrated circuits go operational ..... p 26 Feb 15
Large displays: military market now, civilian next ..... p 24 Jan 25
USAF to test triple navigator ..... p 45 Sep 13
WESCON: the technical highlights ..... p 49 Aug 9
Western sales show more zing ..... p 24 Aug 9
Hood, H.C. & others, High power at millimeters - plasma harmonics the key ..... p 16 Aug 30
Horn, G.W., Muscle voltage moves artificial hand ..... p 34 Oct 11
Hossfeld, H. W., Easy way to test accelerometers ..... p 82 Jul 19
Hu, K. C., Improving pulse rise time with snap-off diodes ..... p 68 Feb 15
Comment ..... p 4 Apr 5
Hudson, M. J. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5
Hundley, R. G., Simulating tactical radar and sonar ..... p 25 Dec 13
Hurwitz, L., Foils get thinner, more versatile ..... p 60 Jul 26

I

Iizuka, K., How to measure field patterns with photosensitive probes ..... p 39 Jan 25
Latest field-mapping improvement - leadless transceiver probe works underwater..... p 56 Jul 19
Ikrath, K. & W. Schneider, Glass-fiber array produces many beams ..... p 28 Nov 1
New transducers for communicating by seismic waves ..... p 51 Apr 12
Comment ..... p 4 May 24
Inderhees, J. A. & S. D. Moxley, New air-traffic system predicts flight paths..... p 27 Feb 1
Ingenito, M., Neglected precision circuits: magnetically coupled multivibrators ..... p 42 Mar 29
Inose, H. & others, New modulation technique simplifies circuits ..... p 52 Jan 25
Irvine, J. A., Reducing winter skids with a transistor warning circuit ..... p 56 Jan 25
Ishii, K. & R. J. Vilmur, Avalanching transistor generates microwaves ..... p 35 Oct 25
Ishii, K. & S. V. Jaskolski, Operating X-band tunnel diodes at Q-band ..... p 32 Dec 27
Ishino, T. & others, Tv dissolve wiper ..... p 40 Sep 6

J

Jack, R. F. & P. R. White, Sintering toughens printed circuits p 60 Jan 11
Jacobs, S., The optical heterodyne - key to advanced space signaling ..... p 29 Jul 12
Jacobson, B. & B. Lindberg, Servo tracks pill in human body ..... p 58 Mar 22
Jaskolski, S. V. & K. Ishii, Operating X-band tunnel diodes at Q-band ..... p 32 Dec 27
Jasper, L. & H.K. Hall, Improving a-d converter accuracy ..... p 38 Sep 13
Jensen, A. S. & W. G. Reninger, TVIST: new look in photoelectric storage tubes ..... p 74 Jun 21
Jezowski, W. G., Better techniques toughen connections on P-C boards ..... p 70 May 10
Johnson, C. M., Injection laser systems for communications tracking ..... p 35 Dec 13
Johnson, E. & A. A. Fleischer, New digital conversion method provides nanosecond resolution ..... p 55 May 3
Johnson, R. W., Circuit with a twist: the cascade follower ..... p 69 Dec 6
Jones, R. W., Unusual waveform analyzer aids automatic testing ..... p 56 Apr 12
Josephs, H.C. & J.T. Maupin, Saving micro-circuit power with tunnel-diode coupling..... p 30 Aug 23

K

Kallus, S. & others, Flitting a wide-band signal into a narrow-band receiver ..... p 47 Mar 8
Kantor, F. W., How ceramic benders control light rays ..... p 80 Jul 19
Radioactive source generates probabilities .... p 54 Sep 13
Kaplan, R. A., Designing lasers with pump-power charts ..... p 23 Dec 27
Kaufman, M. & E. Levine, Realistic sonar trainer simulates ship's wakes ..... p 84 Mar 15
Kazama, K. & others, Tv dissolve wiper ..... p 40 Sep 6
Kear, F. W., Electromechanical timer for lab applications ..... p 78 Feb 15
Keller, J. D., What makes a solder joint good?. p 50 Nov 29
Keyes, R. J. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5
Kime, F. W. & A. Hartley-Smith, Data display system works in microseconds ..... p 26 Nov 29
Kimura, Y. F. T. & others, The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
Klein, G., Schmitt trigger drives low impedance loads ..... p 28 Aug 16
Kobayashi, H. & others, How coded-pulse techniques extend radar range ..... p 34 Nov 22
Kohashi, T. & K. Miyaji, Breakthrough in light amplifiers - el-pc image intensifier uses control-grid ..... p 30 Sep 20
Kokubu, M. & others, How coded-pulse techniques extend radar range ..... p 34 Nov 22
Kornberg, W., Disarmament - what chance? what impact? ..... p 56 Sep 6
Is ionospheric pollution good? or is it bad?... p 40 Apr 26
Nonlinear effects convert laser beam, amplify light ..... p 30 May 3
Kornberg, W. & A. A. McKenzie, Hot line: for cool nuclear decisions ..... p 18 Jun 28
Korte, A., Prototype parts produced efficiently ..... p 82 Feb 22
Koskos, P. & others, S-band paramp approaches noise-figure minimum ..... p 57 Jun 28
Krakauer, S. M & S. W. Sashea, Hot carrier diodes switch in picoseconds ..... p 53 Jul 19
Kramer, A. G. & A. Slocum, How computers align phased-array radars ..... p 29 Nov 15
Kramer, C. & J. C. Balder, Delta modulator codes television waveguide link ..... p 50 Aug 2
Kraus, R. D., Pilot plant mass produces thin films ..... p 64 Jun 7
Krylow, K. E. & others, Semipermanent memory: latest use for twistors ..... p 80 Mar 15
Kumakura, K. & others, Tv dissolve wiper..... p 40 Sep 6
Kummer, W. H. & others, New antenna idea: scanning without phase shifters ..... p 27 Mar 29
Kurimura, T. & K. Yamamura, New way to saturable reactors: stabilizing high-power rectifiers ..... p 62 May 24
Kurokawa, K. & others, The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
Kurosawa, T. & others, Integrated-circuit oscillator requires few components ..... p 40 Dec 13

L

Laakmann, P., Direct coupling shrinks amplifier size and cost ..... p 66 Mar 22
Comment ..... p 4 May 10
Laine, E.F., Getting subnanosecond precision in coax cable delay measurements ..... p 39 Feb 1
Lally, J.F. & R.R. Ciehoski, Coaxial filters - a practical design technique ..... p 35 Aug 30
Lambert, A., Trends in logic circuit design..... p 38 Dec 6
Lane, W. V., & T. V. Gore, Module production quality assured by thermal cycling and life testing ..... p 92 Jul 19
Langlois, P. J., Tunnel diodes boost TRL speed ..... p 50 May 10
Larosa, R. & others, Cut-out slide rule simplifies noise calculations ..... p 64 Feb 8
Last, J. T. & M. A. Gilleo, Optical coupling: new approach to microcircuit inter-connections ..... p 23 Nov 22
Lederer, E. H., Wires cut crystals accurately... p 46 Nov 1
Lee, L.H. & R.B. Mulvany, Now a talking computer answers inventory inquiries..... p 30 Aug 16
Lee, R.M., Speeding digital data over phone lines ..... p 30 Sep 27
Leibowitz, D., What you must know to use ferrites at low frequencies ..... p 38 Mar 1
Leinkram, C. Z. & I. F. Barditch, Wetting agent solves photoetching problems ..... p 54 Dec 13
Lender, A., Faster digital communications with dualinary techniques ..... p 61 Mar 22
Leslie, R. & T. Townsend, Inductors no problem: new thin-film amplifier ..... p 46 Jun 7
Levatch, J. L., Recent tests show tropo scatter better than believed ..... p 42 Mar 1
Levine, E. & M. Kaufman, Realistic sonar trainer simulates ship's wakes ..... p 84 Mar 15
Lindberg, B. & B. Jacobson, Servo tracks pill in human body ..... p 58 Mar 22
Lindberg, E., Solid crystal modulates light beams ..... p 58 Dec 20
Lindgren, N., ESP: is biological radio communication possible?..... p 14 Mar 29
Comment ..... p 4 May 10
Frog's eye goes to Air Force ..... p 18 Mar 8
Ultra-intelligent machines by year 2000 ..... p 46 Mar 1
Lins, S. J. & P. E. Oberg, Thin films: automatic deposition control ..... p 33 Mar 29
Lish, E. F., Spot-testing aids manufacture of high-reliability relays ..... p106 Apr 12
Lovejoy, C. A. & others, Conical scan array uses variable phase shifters ..... p 30 Nov 29
Lowry, M. A., Automatic system probes B-70 stresses ..... p 44 Jul 5
Luscher, J. & others, Silicon rectifier controls power in either direction ..... p 63 Dec 20

M

Mack, E. B. & others, Highlights of small-signal circuit design ..... p 46 Dec 6
Macpherson, A. C. & M. Herndon, Rapid method measures diode characteristics ..... p 50 Jun 14
Maguire, T., Air Force plans net to survive nuclear attack ..... p 28 Mar 22
Air Force research aim: detection capabilities ..... p 72 Apr 26
Air Force upgrades space research microwave center ..... p 28 Jan 25
Arecibo-new era in radio astronomy ..... p 29 Dec 20
The computer: design assistant extraordinary ..... p 16 May 17
Doppler sonar plots ship's course ..... p 14 Nov 22
Eclipse to bare ionosphere's secrets ..... p 26 Jul 19
Fiber optics, servo built into tape handler .... p 66 Feb 22
For life sciences: a do-it-yourself computer ..... p 28 Jul 26
Laser used to confirm physical standards ..... p 74 Mar 22
Laser welds copper leads ..... p 88 Oct 25
The medical laser: new tool for cancer research ..... p 15 Aug 16
Microwelding - laser or electron beam ..... p 23 Jul 5
Modulated beams build microcircuits ..... p 26 Oct 25
National Magnet Lab pushes for 250 kgauss ..... p 56 May 17
Orbital-scatter concept proves out ..... p 26 Nov 8
Polaris-proven electronics to guide Apollo ... p 14 Oct 4
Research in New England ..... p 23 Nov 1
Solid-state ion implants forge tailor-made junctions ..... p 26 Apr 19
West Ford dipole belt girdles earth ..... p 12 Jul 5
Maguire, T. & others, Racing the solar eclipse ..... p 37 Jul 26
Malhotra, P. K. & R. Parshad, Novel coincidence technique for transistor decade counter ..... p 71 Feb 15
Mamayek, D., S-band paramp approaches noise-figure minimum ..... p 57 Jun 28
Manko, H.H. & R.R. Ross, Selecting the right soldering-iron and tip ..... p 48 Aug 16
Mann, R. M., Fresh approach to measuring transistor beta ..... p 47 Jul 26
Quick way to find beta (h-FE), alpha (h-FB), and (h-FC) ..... p 64 Aug 9
Marshall, J. E. & others, New tr yratron peaks at 200 Mw ..... p 94 Apr 12

Marshall, L., Down under- suddenly Mecca for radio men ..... p 20 Jan 4
Martin, A. V. J., French reveal new field-effect structure ..... p 56 Jun 14
Mason, J.F., Air/ground teams seek new systems ..... p 15 Aug 23
Army of the air creates new market ..... p 32 Apr 12
Army seeks gear for air traffic and navigation . p 10 Nov 22
Army wants surveillance, armament gear for air arm ..... p 10 Nov 29
DOD satellite net set for awards ..... p 26 Jun 7
"Far-out" space contracts ..... p 18 Feb 22
Improved air traffic communication and weather nets planned ..... p 92 Jan 4
National Military Command system system moves forward ..... p 20 Apr 26
Navy's new ship program calls for more electronics ..... p 10 Oct 4
New techniques pay off for Polaris fire-control system ..... p 61 Oct 25
Radar designs acquiring new versatility ..... p 10 Sep 20
Spacecom: $100-million-a-year market ..... p 22 Apr 19
Stage is set again for RS-70 debate ..... p 19 Feb 1
Comment ..... p 4 Mar 1
Stand by for those Navy RDT&E contracts: $1 1/2 billion ..... p 10 Sep 13
Mason, W.P., Ultrasonics state-of-the-art report ..... p 33 Oct 18
Maupin, J. T. & H. C. Josephs, Saving micro-circuit power with tunnel-diode coupling..... p 30 Aug 23
Mawhinney, D. D., Arc-protection circuits ... p 54 Feb 22
McFarland, G. & T. Cooper, Designing digital equipment with semiconductor networks ..... p 35 Jan 18
McGown, R. & others, Measuring missile antenna impedance in flight ..... p 36 Jul 12
McKenzie, A. A., Fail stabilizes electret mike. p 68 Oct 25
Hot mikes will record air crew's conversation.. p 53 Nov 15
New code standard in U. S. - International adoption next? ..... p 22 Jul 26
Space round trips push techniques ..... p 40 Sep 27
McKenzie, A. A. & W. Karnberg, Hot line: for cool nuclear decisions ..... p 18 Jun 28
McMechan, J. D. & A. G. Potter, Designing a simple telemeter for medical research ..... p 47 Jan 25
McMillen, A. R., Dips and waves improve soldering ..... p 48 Jul 5
Meieran, S., Tester checks out thermocouple circuits ..... p102 Mar 15
Comment ..... p 4 May 3
Messina, M. & others, Microelectronics around the world ..... p 37 Aug 2
Metlay, M., How rare earth chelate lasers work. p 67 Nov 15
Meyer, B. W., How to design arbitrary-length binary counter ..... p 34 Dec 27
Meyer, J. W. & A. M. Rich, Cryogenics for the electronics engineer ..... p 29 Aug 30
Meyer, J. W. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5
Meyers, P., Circuit trends in nanosecond switching ..... p 35 Sep 20
Michael, H. G., Fail-safe squelch circuit adapts to changing noise levels ..... p 88 Jan 4
Mikton, R., Europe's color-Tv competition ..... p 22 Aug 2
F-104G: boon to Europe ..... p 16 Jun 21
West still leads East in electronics ..... p 22 Apr 5
Mikton, R. & others, Microelectronics around the world ..... p 37 Aug 2
Miyaji, K. & T. Kohashi, Breakthrough in light amplifiers - el-pc image intensifier uses control-grid ..... p 30 Sep 20
Miyakawa, H. & others, How coded-pulse techniques extend radar range ..... p 34 Nov 22
Manser, G. J., The arrowhead: compact new telemetry antenna ..... p 66 Apr 26
Mantague, H. R., Five-layer diode guards cables ..... p 84 Jun 21
Montgomery, G. F., Building a simple transistor tester ..... p 56 Apr 19
Comment ..... p 4 Jun 28
Moore, R. L., High-speed servo positioner bonds mesa transistors ..... p 58 Feb 8
Morrisan, R. F. Jr. & M. N. Sarachan, Binary frequency sensing measures a single pulse ..... p 42 Apr 5
Mosser, R. & W. R. Turner, Supplying low-impedance power for tunnel diodes ..... p 60 Jan 18
Moulton, A. B., Chart gives RLC values for critical damping ..... p 34 May 31
Moxley, S. D. & J. A. Inderhees, New air-traffic system predicts flight paths ..... p 27 Feb 1
Mullarkey, E. J., Accurate gyro balancing .... p 81 Oct 25
Mulvany, R. B. & L.H. Lee, Now a talking computer answers inventory inquiries ..... p 30 Aug 16
Murakami, J. & others, New modulation technique simplifies circuits ..... p 52 Jan 25
Murphy, B. T., High speed integrated circuits with load-compensated diode-transistor logic ..... p 68 Mar 15
Murphy, E. B. & C. A. Pappas, Encapsulating precision antennas in plastic ... p 68 Mar 8
Murphy, R. H., Developing true solid-state static alternators ..... p 58 May 24

N

Nail, C. D., Logarithmic attenuator spans three decades ..... p 47 Nov 15
Nathan, M. I. & G. Burns, Injection lasers .... p 61 Dec 6
Navon, D., Diodes tolerate high radiation..... p 48 Nov 29
Newhoff, H. R., Crystal-controlled multivibrator has better stability ..... p 60 Apr 12
Comment ..... p 4 May 17
Newton, A. & others, Fitting a wide-band signal into a narrow-band receiver ..... p 47 Mar 8
Novotny, G.V., Air Force display selects data from 1,890 channels ..... p 10 Oct 18
Army protects missiles against stray r-f..... p 16 Apr 5
Thermoplastic video tape ready soon ..... p 54 Jul 26

O

Oberg, P. E. & S. J. Lins, Thin films: automatic deposition control ..... p 33 Mar 29
Ohtamo, R.G., Novel bwo doesn't use magnet.. p 47 Sep 27
Orvedahl, W. & J. H. Shepherd, Designing data registers with simple diode circuits ..... p 48 Feb 22
Osborne, T.E., Mechanizing transistor switch design ..... p 47 Oct 18
Osborne, W. E., Infrared mine detector a reality ..... p 54 Aug 2
Infrared system detects intruders ..... p 26 Aug 16
Ottenstein, A. S. & R. L. Paul, Sequence pulse generator saves transistors ..... p 44 Aug 2
Overstrom, A. & E. Compagna, Welding improves grid construction..... p 62 Sep 20

P

Pappas, C. A. & E. B. Murphy, Encapsulating precision antennas in plastic ... p 68 Mar 8
Pappenfus, E. & others, Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12
Parshad, R. & P. K. Malhotra, Novel coincidence technique for transistor decade counter ..... p 71 Feb 15
Patterson, J. L., Will neon photoconductors replace relays in low-speed logic? ..... p 46 May 10
Patton, B. W., New aerospace transmitter packs 3-watts in fist-sized can ..... p 52 Jan 18
Paul, R.L. & A.S. Ottenstein, Sequence pulse generator saves transistors ..... p 44 Aug 2
Payne, S., ComSat tackles problems - technical and fiscal ..... p 18 Aug 9
Long-range spectrometer seeks missile defense clues ..... p 16 May 10
Pecina, R. & T. Evans, Taking human error out of nuclear experiments ..... p 46 Jun 14
Peck, D.S. & E.R. Schmid, Surface effects of ionizing radiation ..... p 34 Oct 4
Perry, J. T. Jr. & others, Semipermanent memory: latest use for twistors ..... p 80 Mar 15
Perry, W., Jr., Tv test uses two colors ..... p 42 May 3
Petrack, P., Immersion gold solution used in electroplating ..... p100 Feb 15
Phillips, D. K., Unity-gain buffer acquires precision by feedback ..... p 36 Dec 20
Pieper, C., Sparks shape Alnico magnets ..... p 60 Sep 13
Poppelbaum, T. L., Tv camera tracker - can it detect missile decoys?..... p 51 Apr 26
Potter, A. G. & J. D. McMechan, Designing a simple telemeter for medical research ..... p 47 Jan 25
Preiss, R. P. & L. C. Varuzzo, Notation language speeds production changes ..... p 92 May 3
Prouty, T. P., Using varactors to extend frequency-control range ..... p 48 Nov 8
Puthoff, H. E. & J. T. Tippett, Optical computers approach reality ..... p 72 May 3

Q

Quist, T. M. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5

R

Rabinovici, B. & others, Fitting a wide-band signal into a narrow-band receiver ..... p 47 Mar 8
Rado, J. J., Designing input circuits with lowest possible noise ..... p 46 Aug 2
Ramsey, S., Is USSR ahead in space instruments? ..... p 16 Jul 5
Ratner, V.A., Predetection recording: Solution to the telemetry dilemma? ..... p 30 Sep 13
Rediker, R. H. & others, Modulated infrared diode spans 30 miles ..... p 38 Apr 5
Reed, H. H., Rapid evaluation of complex receiving systems ..... p 44 Feb 1
Reid, M., Air-sea-sub display plots naval targets ..... p 20 Jun 7
Airlines look to computers to end delays..... p 66 Oct 25
LEM electronics faces new challenges ..... p 22 Jul 19
Project Apollo's mission: get two Americans to the moon ..... p 18 Feb 8
Reimer, W. A. & others, Semipermanent memory: latest use for twistors ..... p 80 Mar 15
Reninger, W. G. & A. S. Jensen, TVIST: new look in photoelectric storage tubes ..... p 74 Jun 21
Rettig, A. S., Computers in the front lines: micromodules make it possible ..... p 77 Jan 4
Revzin, M., Radio-interference control ..... p 56 Apr 26
Comment ..... p 4 Jun 7
Rhoades, W. T., Backward-diode clamp reduces tunnel-diode delays ..... p 56 Feb 8
Rich, A.M. & J.W. Meyer, Cryogenics for the electronics engineer ..... p 29 Aug 30
Riel, G. K., New underwater gamma spectrometer ..... p 56 Mar 8
Ring, D., Machine simplifies bonding process ..... p 60 Feb 1
Robberson, E., R-F oscillator has improved stability..... p 62 Aug 9
Robinson, A. S., Simple transistor modulators improve sideband communications ..... p 54 Mar 8
Robinson, T. L., Transfer process avoids P-C open circuits ..... p 68 Jan 18
Rodrigues de Miranda, J., Miniature components aimed for mass markets ..... p 64 Apr 19
Roedl, K. & R. Stoner, Unique synchronizing technique increases digital transmission rates.. p 75 Mar 15
Rollett, J. M., Capacitor provides outer coupling for modern coaxial-line circuits .... p 62 Jan 18
Comment ..... p 4 May 31
Rosengreen, A., Experimental neuristor gives nerve-like pulse propagation ..... p 25 Mar 1
Ross, R.R. & H.H. Manko, Selecting the right soldering-iron and tip ..... p 48 Aug 16
Ruegg, H. W., Transistor-transistor logic circuits ..... p 54 Mar 22
Rumsey, W. & others, S-band paramp approaches noise-figure minimum ..... p 57 Jun 28
Russell, C. R. & others, New thyratron peaks at 200 Mw ..... p 94 Apr 12
Ryder, J. D., Lab courses ..... p 4 Aug 23

S

Saito, S. & others, The versatile point-contact diode - how it detects and amplifies laser light ..... p 82 Jan 4
Comment ..... p 4 Mar 8
Sakamoto, T. & others, How coded-pulse techniques extend radar range ..... p 34 Nov 22
Sallo, J. S., Plated holes simplify memory design..... p 34 Nov 1
Sanford, R. J., Can RFI control prevent weapons failures? ..... p 43 Nov 8
Sarachan, M. N. & R. F. Morrison Jr. Binary frequency sensing measures a single pulse ..... p 42 Apr 5
Sasaki, I. & others, Integrated-circuit oscillator requires few components ..... p 40 Dec 13
Sauer, W. A., How to achieve majority and threshold logic with semiconductors ..... p 23 Nov 29
Schindler, H.R., Using the latest semi-conductor circuits in a UHF digital converter.. p 37 Aug 30
Schlesinger, E. R., Aiming a 3-ton telescope hanging from a balloon ..... p 47 Feb 8
Schmid, E.R. & D.S. Peck, Surface effects of ionizing radiation ..... p 34 Oct 4
Schmid, H. & B. Grindle, Pulse-width modulator offers precision performance ..... p 29 Oct 11
Schmid, P.E., Secondary emission makes klystron tubes self quenching ..... p 40 Oct 18
Schmidt, M., Improved Schmitt trigger uses SCR ..... p 68 Apr 26
Schneider, W. & K. Ikrath, Glass-fiber array produces many beams ..... p 28 Nov 1
New transducers for communicating by seismic waves..... p 51 Apr 12
Comment ..... p 4 May 24
Schoenike, E. & others, Better superhets for sideband reception ..... p 39 May 10
Comment ..... p 4 Jul 12
Schuller, M. & W. W. Gaertner,

Micropower circuits – new frontier in solid state ... p 47 Jul 19
Schwartz, J., Unijunction transistor simplifies voltage-frequency converter ... p 56 Oct 25
Setliff, J. E. & J. A. Walstan, Designing servo amplifiers for high efficiency ... p 62 Feb 8
Comment ... p 4 Apr 12
Shahnazarian, T. & W. F. Barwitt, Checking connector production ... p 96 Feb 8
Shang, D. C. T., Chemicals affect oscillator output ... p 46 Dec 13
Share, I., Easy ways to make microwave phase measurements ... p 50 Mar 8
Shephard, J. H. & W. Orvedahl, Designing data registers with simple diode circuits ... p 48 Feb 22
Sheppard, A. P. & J. W. Dees, New millimeter components and techniques ... p 33 Jan 11
Shergalis, L. D., Blast signatures – key to test ban treaty ... p 24 Feb 22
Electronics for the SST – what's ahead? ... p 24 Nov 15
Light isolates amplifier stages ... p 43 Nov 1
Looking for something to do? Try developing MM components ... p 24 Jan 18
600,000 WPM printer races computer ... p 26 May 24
Shergalis, L. D. & others, High power at millimeters – plasma harmonics the key ... p 16 Aug 30
Sherr, P. E. & H. R. Farrah, New approach to weather data: every plane a station ... p 38 Jul 12
Shores, M. W., Communications range nomograph ... p 41 Dec 20
Shudo, K. & others, Tv dissolve wiper ... p 40 Sep 6
Siffard, B. & G. Hagn, Easy-to-use chart for VSWR ... p 38 Nov 22
Silverman, J. H., Now you can use nonreciprocal devices at low frequencies ... p 56 Feb 22
Simons, K., Sweep measurements – making the tough ones easy ... p 52 Apr 19
Skole, R. & others, Microelectronics around the world ... p 37 Aug 2
Skoures, A.E., Choosing logic for micro-electronics ... p 23 Oct 4
Slocum, A. & A. G. Kramer, How computers align phased-array radars ... p 29 Nov 15
Smith, D., Big printed-circuit fight: Technograph loses round 1 ... p 24 Jun 7
How to succeed in business on someone else's research ... p 22 Jul 12
Industrial spy – aristocrat of thieves ... p 32 Jul 19
The lone nominee – his views ... p 38 Aug 9
Smith, R., Atomic test ban – what does it mean to our industry? ... p 18 Aug 2
Smith, W.W., Fast agc amplifier locks monopulse radar on target ... p 34 Sep 27
Solomon, L., Brighter color Tv in offing? ... p116 Jan 4
New tubes and circuits for consumer electronics ... p 47 Jan 11
Sommer, R.C. & A. Hauptschein, Getting the most out of aerospace telemetry ... p 23 Sep 27
Soshea, S. W. & S. M. Krakauer, Hot carrier diodes switch in picoseconds ... p 53 Jul 19
Spangler, E. R. & P. F. Glaser, Inside the orbiting geophysical observatory ... p 61 Feb 15
Stapelfeldt, R., Multitone oscillators – new source of simultaneous frequencies ... p 86 Jan 4
Stearns, L.B., Preformed circuits reduce joining operations ... p 45 Aug 23
Stein, L. F., Versatile R-F monitor shows power and VSWR ... p 44 Mar 29
Stephenson, J. G., Resonant-cavity tuning now made easy ... p 46 Jan 18
Stevens, R. T., Nomograph speeds amplifier design ... p 38 Jul 5
Stone, R. B. & G. M. White, Digital correlator detects voice fundamental ... p 28 Nov 22
Stoner, R. & K. Roedl, Unique synchronizing technique increases digital transmission rates ... p 75 Mar 15
Strasser, J., After Echo II: what and why? ... p 24 Sep 6
First color facsimile transmitted by satellite... p 51 May 24
For space, an electronics lab ... p 42 Sep 13
GaAs laser transmits wideband data ... p 24 Oct 18
Holmes: it wasn't frustration (interview with D.B. Holmes) ... p 22 Jun 21
If a satellite fails – go up and fix it ... p 12 May 31
Latest satellite stabilizers let gravity do the work ... p 16 Aug 23
Mariner C shaping up for '64 ... p 16 Aug 30
Need weather data? Buy a satellite ground station ... p 20 Jul 26
New look in this year's comsats ... p 18 Jul 19
New twist in space tracking: the vehicle tracks the ground ... p 10 Nov 15
Syncom's time delay: no great problem ... p 11 Nov 8
Target date for moon base 1972? ... p 14 Sep 27
ZIP goes the mail ... p 26 Jul 12
Strasser, J. & others, Racing the solar eclipse ... p 37 Jul 26
Sugano, T. & others, Integrated-circuit oscillator requires few components ... p 40 Dec 13
Susi, F., Solving the AGC dilemma – servo system uses attenuator ... p 60 Jul 19
Sussman, V. & R. Carruth, Epoxy pellets improve diode production ... p 64 Jul 26
Sutton, G. W., Plasma accelerator work shows promise ... p 38 Apr 26
Suzuki, T. & others, How coded-pulse techniques extend radar range ... p 34 Nov 22
Swartz, G. A., New millimeter wave device – beam-plasma amplifier ... p 40 Nov 8
Sylvan, T. P., New device simplifies power supply design ... p 39 May 17

T

Takeya, T. & others, How coded-pulse techniques extend radar range ... p 34 Nov 22
Taki, Y. & others, How coded-pulse techniques extend radar range ... p 34 Nov 22
Tarui, T., New deflection circuit uses SCR, saves power ... p 56 Aug 9
Taylor, R. C., & others, Measuring missile antenna impedance in flight ... p 36 Jul 12
Teich, W. W. & others, C-W amplitrons for space telemetry ... p 78 Apr 26
Terrio, F. G. & others, New antenna idea: scanning without phase shifters ... p 27 Mar 29
Theiler, W. C., Electron beam welding solves relay sealing problems ... p 90 Jun 28
Theiss, J. B., More target data with side-band coherent radar ... p 40 Jan 18
Comment ... p 4 Mar 29
Thompson, P.N., Logic principles for multi-emitter transistors ... p 25 Sep 13
Tippett, J. T. & H. E. Puthoff, Optical computers approach reality ... p 72 May 3
Todd, C. D., Designing NRE monostable multivibrators ... p 34 Sep 13
The negative resistance element (NRE) a new circuit component ... p 21 May 31
Design of D-C switches with negative resistance elements ... p 32 Jul 12
Using a new component: the NRE as a free-running multivibrator ... p 50 Jul 26
Comments p 4 Jul 5, p 4 Jul 12, ... p 4 Jul 19
Raising tank-circuit Q with the NRE ... p 30 Oct 4
Tunnel diode detects currents down to 100 femtoamperes ... p 33 Apr 5
Comment ... p 4 Apr 26
Tamaino, M.F., Active components: more breakthroughs on the way ... p 24 May 17
Bright future seen for organics ... p 51 Oct 11
Chelate lasers are coming on strong ... p 32 Apr 26
Materials for space-age electronics ... p 37 Oct 25
Townsend, T. & R. Leslie, Inductors no problem: new thin-film amplifier ... p 46 Jun 7
Trabold, W.G., Continuous readout of magnetic cores ... p 38 Sep 6
Turner, W. R. & R. Masser, Supplying low-impedance power for tunnel diodes ... p 60 Jan 18
Tuttle, G. T., How to quiz a whole memory at once ... p 43 Nov 15

U

Una, Y. & others, The versatile point-contact diode – how it detects and amplifies laser light ... p 82 Jan 4
Comment ... p 4 Mar 8
Uzunoglu, V., A new look at negative resistance devices ... p 35 Mar 8
Comment ... p 4 Apr 26

V

Vogt, T., New light on air traffic: bright plan display with alphanumerics ... p 42 Jul 26
Varuzzo, L. C. & R. P. Preiss, Notation language speeds production changes ... p 92 May 3
Veth, G. J., Optical soldering promotes automated packaging ... p 90 Mar 22
Vieser, C. F. & M. N. Brown, Serrations solve wire termination problem ... p 86 Jan 25
Villeneuve, A. T. & others, New antenna idea: scanning without phase shifters ... p 27 Mar 29
Vilmur, R. J. & K. Ishii, Avalanching transistor generates microwaves ... p 35 Oct 25
Vogel, S., High-frequency optical phonon masing reported ... p102 Jan 4
RFI – causes, effects, cures ... p 37 Jun 21
Comment ... p 4 Aug 30
Van Zastrow, E. E., Power and control circuits. p 51 Dec 6
Voorips, H. C. & others, Silicon rectifier controls power in either direction ... p 63 Dec 20

W

Wade, G. & W. M. Feist, Are hot cathodes on the way out? ... p 39 Jun 7
Waibel, E., Radiosonde measures after-effects of solar events ... p 47 Apr 19
Waldhauer, F. D., Latest approach to integrated amplifier design ... p 24 May 31
Walstan, J. A. & J. E. Setliff, Designing servo amplifiers for high efficiency ... p 62 Feb 8
Comment ... p 4 Apr 12
Wanlass, F. M., Navel field-effect device provides broadband gain ... p 30 Nov 1
Warner, R. M. Jr. & G. Csanky, Put more snap in logic circuits with field-effect transistors ... p 43 Jun 14
Wasik, J. W., Computer runs missile tracker ... p 12 Jun 14
Mercury to carry new experiments and slow-scan Tv ... p 18 Mar 22
Test-ban monitors set for launch ... p 57 Oct 18
Comment ... p 4 Aug 30
Undersea transmitters to locate missile impacts ... p 18 Feb 15
Watford, S. E. Low-cost circuit measures frequency translation ... p 51 Nov 8
Webb, J. A., Unique frequency comparator has sense of direction ... p 36 Mar 1
Weber, S., Laser beam carries Tv video and audio ... p 28 Feb 22
Sub system goal is 20-year life ... p 75 Oct 25
Weber, S. & M. F. Wolff, Solid progress in solid-state seen at Philadelphia ... p 12 Mar 1
Weibel, G.E. & H. Dressel, Generator for one-millimeter waves ... p 21 Aug 16
Welsh, N., How diodes keep current to constant value ... p 74 Jan 25
White, B. S., Circuit converts one-trace scopes to raster display ... p 33 Nov 29
White, G. M. & R. B. Stone, Digital correlator detects voice fundamental ... p 28 Nov 22
White, P. R. & R. F. Jack, Sintering toughens printed circuits ... p 60 Jan 11
Whitley, J. H., Which permanent electrical connection should you use? ... p 50 Jan 25
Wieder, H. H., Analog ratio computer uses Hall multiplier ... p 46 Nov 8
Wiley, C.M., Here's that new color-Tv tube ... p 26 Jan 28
Home appliances: market for solid state ... p 14 Sep 13
NEC: Electronics in the midwest ... p 31 Oct 25
Next frontier the oceans? ... p 56 Nov 8
R & D goes back to earth ... p 30 May 17
Telemetry on muscle power ... p 14 Sep 20
Will solid state nip relay markets? ... p 66 May 10
Wilkerson, J. L., How to choose transistors for low noise ... p 50 Jan 11
Williams, D. L. & K. W. Dunlap, Will lasers weld circuit components? ... p 54 Jul 12
Williams, L. E. & others, Conical scan array uses variable phase shifters ... p 30 Nov 29
Williams, L. L. & D. J. Hamilton, How to make tunnel diodes even more useful ... p 52 Jun 7
Williams, M., Thin magnetic films create logic circuits ... p 62 Feb 22
Willing, H. A., New technique protects receivers from high power ... p 32 Mar 1
Willis, J., High precision d-c level shifter reduces output impedance ... p 65 May 3
Wilson, H. L. & others, Vacuum deposited circuits use field effect ... p 80 Apr 12
Wolfert, P., Near-field plotter: design tool for millimeter-wave antennas ... p 29 Dec 27
Wolff, M. F., Advances in microminiaturization ... p 45 Feb 15
Air Force outlines latest R & D plans ... p 16 May 24
Conductive memory points to new displays... p 10 Nov 8
Device powers go higher ... p 57 Nov 15
Field modulates laser ... p 26 Apr 26
Comment ... p 4 Jun 28
Frequency control lags ssb ... p 16 Jun 17
Future keyed to materials properties ... p 66 Sep 6
Gatling-gun laser – novel approach to optical radar ... p 25 Sep 20
How hi is fi? (interview with P. G. Goldmark) ... p 33 Jun 14
Comment ... p 4 Aug 2
Look at what optical semiconductors do now ... p 32 Jun 28
New field effect device may aid integrated circuit design ... p 44 Nov 29
New laser structure drives output past 1 w ... p 24 Jun 21
When will integrated circuits go civilian? Good guess: 1965 ... p 22 May 10
What's new in computer memories ... p 35 Nov 8
Wolff, M. F. & S. Weber, Solid progress in solid-state seen at Philadelphia ... p 12 Mar 1
Wolff, M. F. & others, Microelectronics around the world ... p 37 Aug 2
Wright, C. S., Unique bridge measures antenna operating impedance ... p 51 Feb 22

Wright, J. C. & W. L. Blair, F-m feedback stabilizes airborne solid-state VHF transponder ..... p 66 Dec 6

Y

Yamamura, K. & T. Kurimura, New way to saturable reactors: stabilizing high power rectifiers ..... p 62 May 24
Yanai, H. & others, Integrated-circuit oscillator requires few components ..... p 40 Dec 13
Yasuda, Y. & others, New modulation technique simplifies circuits ..... p 52 Jan 25
Yashida, M. & others, Integrated-circuit oscillator requires few components ..... p 40 Dec 13
Yashida, T. & others, How coded-pulse techniques extend radar range ..... p 34 Nov 22
Young, L. R. & others, Conical scan array uses variable phase shifters ..... p 30 Nov 29
Young, R.E., Why U.S. lags Europe in automatic landing ..... p 21 Aug 23
Yu, Y.P., Two-phase oscillator cover 0.1 to 1,000-cps ..... p 27 Oct 4

Z

Zega, B. & others, Silicon rectifier controls power in either direction ..... p 63 Dec 20
Zito, R. Jr., Three-dimensional display uses atomic resonance ..... p 52 Jan 11